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Pacific Northwest Ecoclass Codes for Plant Associations

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ABSTRACT

The primary purpose of this publication is to provide a complete listing of codes identifying various vegetation resources in the Pacific Northwest. These codes are divided into two parts: life form of vegetation and identification of plant associations (habitat types, range sites, or potential natural vegetation). The codes are alphanumeric with the alpha codes taken from the first letter of various plant life forms or major species. For example, CDS6 12 represents **C**onifer life form, **D**ouglas-fir the dominant climax conifer with a **S**hrub understory, shrub group number **6** (spiraea-snowberry-bearberry group), plant association number **12**: Douglas-fir/common snowberry/twinflower as described in the publication R6 Ecol 104-85 by L. Volland.

The book is made up of six parts. First is a basic discussion of ecological classification criteria used

to develop plant associations and the concept behind coding. Then follow five appendices:

1. A cross reference by several criteria such as very poor forest sites, coastal sand dunes, and Society of American Forester's cover types.
2. A grouping of plant associations into mapping units for integrated resource inventory.
3. Application of the component land classification for the United States and Ecoregions where associations are assigned to each stratification level.
4. Description of Kuchler's Potential Natural Vegetation Types with assigned associations.
5. Ecoclass coding system for the Pacific Northwest.

PREFACE

Ecoclass codes are primarily used in inventory and mapping. They provide a means by which all surface resources on National Forests in the Pacific Northwest Region can be identified and defined according to their potential to grow vegetation, or in some cases, their lack of potential such as glaciers, sand dunes, and rock outcrops. One important function is to provide a shorthand code for plant associations. Plant associations are the end product of sampling, analysis, and interpretation of plant communities. They represent our best estimate of the natural potential dominance of species, their productivity, and reaction to disturbance.

Classification of plant associations is a long-term activity in the Region. As a result, new ecoclass codes are constantly being assigned as new

associations are developed. This edition contains 415 new associations and their codes. Codes have been published in five previous editions, each with a different name and date. PLEASE NOTE that the date of the last edition is shown under the date on the title page and on Appendix 5, Ecoclass Codes. The last edition and all previous editions may be destroyed because once an ecoclass code is established, it will never change. All ecoclass codes in the first edition are exactly the same as in this edition. If the association assigned to an ecoclass code is changed, a note will appear after the code indicating what it has been changed to.

Appendices have been added to later editions of ecoclass codes as new uses for inventorying vegetation have evolved. The new appendix here summarizes mapping units and their assigned associations for Integrated Resource Inventory. Other appendices, appearing in previous editions, have been updated by adding the 415 new associations.

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Introduction

Ecoclass codes identify different kinds of potential natural plant communities (associations) using a computer-friendly alphanumeric system. These codes, which are a combination of plant life form and species, can be interpreted directly because they are derived from the first letter of common words, such as "C" for conifer, "S" for shrub, and "G" for grass. In forested plant communities, species codes are added to the life form code--for example, "P" for ponderosa pine, "H" for western hemlock, and "F" for silver or noble fir (i.e., CP, CH, CF). Numeric codes are added to alpha codes to complete a six-digit identifier for plant associations. Thus, in the code CWG1 12, "C" = conifer climax plant community; "W" = white (or grand) fir major climax species; "G" = grass ground vegetation; "G1" = the pinegrass group of grasses; and "12" identifies the association: ABGR/CARU-ASH (grand fir/pinegrass-ash soil).

The coding system provides: (1) Flexibility, since many basic units, associations, are not yet known; (2) an open-ended system that can be expanded at any time; (3) computer compatibility that permits aggregating similar classification units to answer questions posed by the land manager; (4) identification of potential natural plant communities rather than a successional stage; (5) as much direct interpretability as possible--i.e., codes that will mean something to the reader; and (6) a description of the identified unit.

The system is not designed as a hierarchical classification or a plant community taxonomy; it is only a framework for identifying associations. Plant association is the only category that is classified. Similar plant life forms are grouped together regardless of similarities or differences between associations. For example, CP identifies conifer forest where ponderosa pine is the climax dominant. Associations range from open pine/bunchgrass savanna producing only 10 cubic feet of wood and 430 pounds of herbage per acre per year (CPG1 11: PIPO/AGSP) to closed forest ponderosa pine-quaking aspen/bluegrass dry meadow producing 55 cubic feet of wood and 1,200 pounds of herbage per acre per year (CPH3 11: PIPO-POTR/PONE). These associations fall into two different formations according to Driscoll

et al.'s (1984) ecological land classification framework for the United States.

Ecological Classification

Plant community classification in the Pacific Northwest Region of the Forest Service follows the guidelines established in FSM 2060 of 1986. Plant association is designated as the lowest level of classification for vegetation (2061.11b). Classification utilizes a "single level" approach that considers several attributes of potential natural plant communities. This approach was chosen because plant communities exist at only one level--the ground level. Classification is accomplished without regard for existing hierarchical systems, each of which have different inherent criteria for grouping associations into higher classes. "Phases" (Daubenmire and Daubenmire 1968) are not used. They are given association status whenever differences in plant community types warrant separation.

Terms Used

The term "habitat type" has been dropped from usage to avoid confusion and misunderstanding. The term originated with Daubenmire (1952) when he changed the name plant association to habitat type for mapping purposes, and defined habitat type as "the land area capable of supporting the same association." Since then, attributes of habitat types have become both confusing and misleading.

The concept of habitat type as a land classification is unfortunate because "land"--soil and topography--is not part of the classification (Pfister and Arno 1980). The only thing classified is floristic similarity of plant communities.

Classification of forest site potential has also been claimed as a characteristic of habitat type. However, site productivity apparently was not considered in classifying Douglas-fir/ninebark by Pfister et al (1977) and Steele et al (1981), since site index for Douglas-fir (age 50) ranged from 43 in eastern Montana to 52 in central Idaho to 58 in western Montana. The term plant association is preferred, since it connotes classification of plant communi-

ties, not components of the land. One can map plant associations as easily as habitat types.

Potential Natural Vegetation

Plant communities are classified using the "potential natural vegetation" concept. This is essentially similar to "climax" as discussed by Daubenmire (1952). It is "the biotic community that would become established if all successional sequences were completed without interference by humans under present environmental conditions" (FSM 2060.5).

Fire

The effects of natural fire, however, are excluded. Classification is based on the potential vegetation that would occupy a site in the absence of fire.

This is an important consideration, because some form of crown fire, underburning, or a combination of the two was once a natural part of the environment. Crown fire, for example, would kill a stand of timber. On the east side of the Cascade Crest, either lodgepole pine or larch would commonly colonize the burn. After a number of years, Douglas-fir, white fir, or subalpine fir would become established and would become dominant as the pioneer trees died of old age. These sites are classified as fir potential. West of the Cascade Crest, Douglas-fir was the common pioneer species, and it would eventually be replaced by western hemlock or silver fir. These sites are classified as hemlock or fir potential.

A much more subtle but equally important relationship occurs with underburning. In many cases, ponderosa pine historically was maintained by light, periodic, lightning ignited underburns every 8 to 25 years. With fire suppression, Douglas-fir, white fir, and sometimes incense cedar colonize the sites, often becoming dominant over pine. These sites are classified as fir or cedar potential.

A somewhat different situation occurs at the transition from forest to steppe vegetation. Under pristine conditions, fire prevented ponderosa pine, juniper, or sagebrush from colonizing the grassland. Where pines, juniper, and sagebrush

are suited to the site, it is classified as pine, juniper, or sagebrush potential.

Erosion

Erosion or soil damage may create sites with a potential natural vegetation different from that of undisturbed sites. Plowing of the grassland in Oregon's Crooked River National Grassland destroyed the top soil horizon and resulted in a 2-to 4-inch soil loss during the drought of the 1930's. These sites no longer have a potential for juniper/sagebrush/bluebunch wheatgrass. Instead, the new potential seems to be juniper/rabbitbrush/crested wheatgrass.

Eroded soil conditions pose problems because too little time has elapsed for the vegetation to develop to the new full natural potential. In these cases, all one can do is provide a "best estimate." For example, when subalpine elk sedge (GS39 11: CAGE-ALPINE) is eroded, the dark "A" horizon is removed, leaving a gravel-covered "B" horizon dominated by Douglas' knotweed. The new potential natural vegetation is called "POPH-ALPINE" (FS59 11). Dredge tailings and mining spoils pose similar problems.

Introduced Plants and Animals

Introduced plant and animal species are considered a part of potential natural flora and fauna when their competitive ability allows them to persist in stable plant communities. Examples in the Pacific Northwest include cheatgrass, Kentucky bluegrass, crested wheatgrass, chukar partridge, and Rocky Mountain elk.

Classification Criteria

Four criteria are used in classification: (1) floristic similarity, (2) productivity, (3) plant community response to management, and (4) identifiability when disturbed. Classification proceeds in the following sequence:

Floristic Similarity

Plant communities are grouped into types according to similarities in species dominance, as in the system used by Daubenmire (1952). This is considered the "first approximation."

Productivity

Next, productivity estimates are made for each tentative association. Estimates are derived from intensive sample plot data. Herbage production is estimated for both forest and nonforest associations. In forest associations, additional productivity estimates include: site index, growth basal area, and cubic volume growth index by species and stand density index, total basal area, and stand density index cubic volume production for stands. Productivity estimates by species show which species grow best in an association.

Productivity is used to "validate" the concept that associations do indicate a set of specific environmental conditions. If the 95-percent confidence interval of the various productivity estimates does not exceed + or - 20 percent of the mean, the tentative association has been validated for a second approximation. Potential associations do not meet this criterion about 30 to 40 percent of the time, so new associations must be formed which have less variability in production.

Productivity is considered just as "natural" as species dominance because it too is influenced by environmental factors (Wykoff et al. 1982). If plant associations are to be used as a kind of site indicator, productivity must be part of the classification.

Response to Management

The "second approximation" associations are next evaluated for their vegetative response to management activities: logging, reforestation, revegetation, burning, and where appropriate, livestock grazing.

The first question asks whether plant community response to treatment is significantly different between closely related associations--should they be split or lumped? The second question asks whether the stands that make up an association would all respond similarly to treatment. If they would not, then new associations might be considered, as discussed by Arno et al. (1985).

In some cases, livestock impacts on vegetation must be dealt with. These impacts are assessed by use of livestock forage rating guides. Livestock

tend to graze some plant species more heavily than others. With overgrazing, three changes in plant density and composition take place: (1) preferred species decrease (these are called "decreasers"); (2) less palatable species increase (these are called "palatable increasers"), until continued heavy use causes them to decrease also; and (3) unpalatable species increase (these are called "unpalatable increasers"). With serious depletion of the plant community, "invaders" colonize the site.

Livestock forage rating guides estimate how much depletion has occurred by placing current vegetation into one of four classes: "good"--75 to 100 percent of potential natural species density and composition; "fair"-- 50 to 74 percent of potential; "poor"--25 to 49 percent of potential; and "very poor"--less than 24 percent of potential natural vegetation and not enough decreasers to permit upward range trend with adjustment in livestock management.

These classes pose restrictions on density and composition of species in classification of associations. The "good" class requires a confidence interval for species composition of no more than + or - 12.5 percent of the mean. Thus, plant associations, if they are the basis for livestock forage rating guides, can vary no more than + or - 12.5 percent of the mean for species density and composition. This precision level is difficult to attain and meet requirement number four--identification in the field in any stage of disturbance, particularly in the "poor" and "very poor" classes. Therefore, composition and density of decreasers, which may be two or sometimes three species, is often used as a criterion for establishing associations and livestock forage rating guides. The "third approximation" occurs after this step.

Identifiability when Disturbed

"Third approximation" associations are next tested to see if they can be identified by means of a written key in nearly any stage of disturbance, particularly in poor and very poor forage rating. Key indicator species generally cannot be limited to decreasers, and seldom to palatable increasers. At times, the key to identifying associations will have to include "invaders"--species that inhabit sites that have been burned, clearcut, or very

heavily grazed--together with soil and topographic criteria.

This four-step approach ensures that the criteria for classification include a number of natural biological attributes, and that an association reflects a certain limited range of species dominance, productivity, and response to treatment.

Single-level Classification

Using four kinds of criteria for classifying associations suggests a single-level approach. Grouping associations into a fixed hierarchy is difficult because only one of the criteria can be used for agglomeration--i.e., similarity in species dominance or similarity in productivity or similarity in reaction to treatment.

The concept used, an "agglomerative, reticulate classification," provides maximum flexibility for answering land management questions. Associations can be grouped into different kinds of classes to meet management needs--for example, those producing less than 20 cubic feet per acre per year of wood vs. those producing 20 to 50 cubic feet; those with climax ponderosa pine vs. those with successional ponderosa pine; or those formerly disturbed by natural underburning vs. those disturbed by crown fire.

Various agglomerations of ecoclass codes are contained in Appendixes 1, 2 and 3. Appendix 1 groups codes according to: wetlands, extremely poor sites, low productivity forest sites, coastal sand dunes, alpine and subalpine, standard range types, SAF cover types, Kuchler's potential natural vegetation, and two wildlife habitat cross-references. Appendix 2 groups associations into a stratification used for vegetation resource inventory. Appendix 3 groups associations according to the "ecological land classification framework for the United States" (Driscoll et al. 1984).

Resource Information

But associations do **not** indicate the sum of the environment, they are not a land classification, and they do not answer all land management questions. A land manager needs six kinds of resource information to make a sound decision concerning such things as treatment of vegetation,

harvesting trees, grazing livestock, evaluating wildlife habitat and planning recreational use. These kinds of information are:

1. Current vegetation on the site such as timber stand condition showing size and volume by species, or rangeland condition with species dominance and forage production. This is what the manager has to work with.
2. Soil on the area and its characteristics, such as stability, resistance to compaction, erodability, moisture-holding capacity, and fertility. Soils often limit treatment opportunities.
3. Landform of the area--steepness, shape, and length of slope, aspect, geologic stability, and nature of the ridge or bottom if present. Landform commonly dictates various treatment opportunities.
4. Size of the tract, its location with respect to roads, fences, water, and other vegetation types, and its proximity to rivers, ridgetops, and other management-limiting features.
5. Current use of the area, such as primary livestock range, timber sale, critical wildlife area, foreground landscape unit, or dedicated area such as campground or botanical area.
6. Potential of the site (plant association) in regard to productivity, response to treatment, and opportunities for or limitations on management. Plant associations provide predictability for choosing management options.

Ecoclass codes are designed for compatibility with all vegetative resource inventories and with the Total Resource Information (TRI) System (USFS 1978). Codes are located in a six-digit ecoclass field for each cell. A cell is the basic mapping designation and data storage unit for the TRI System. Each ecoclass code will have all other information identified with it, such as elevation, steepness of slope, type of soil, present stand condition, and past management activities. Thus, if a long-range planner wishes to know how much land might be suitable for sophisticated logging

systems, he can request a list of cells with slopes of more than 80 percent that support any coniferous life form except juniper (CJ) and alpine forest parks (CA), which do not have enough timber productivity to warrant expensive logging techniques. Ecoclass codes can form a layer in geographical information systems (GIS).

Ecoclass Coding

Codes are composed of two parts: **life form**, which is an identification system, and **association**, which is a classified unit.

Life form	Association
CDS6	11

Life form is composed of two parts: The first two characters identify a general kind of plant life form or other feature; the second two characters identify a species group which modifies the first two characters. The first character is always an Alpha code taken from the first letter of a word describing a plant life form or other feature, such as "C" for conifer, "H" for hardwood, "G" for grass, or "N" for non-vegetated (areas with less than 10 percent potential natural plant cover). The second character is always Alpha and modifies the first--for example, "C" for conifer is modified by "P" for ponderosa pine (CP), or "D" for Douglas-fir (CD).

The second-two characters represent a species group. They may be alphanumeric or numeric. Alpha codes take the first letter of a word describing a plant life form and numeric codes are keyed to a group of plant species of similar ecological amplitude. For example, S6 is derived from "S" for shrub under a forest community and "6" for the "spiraea-snowberry-bearberry" species group (CDS6). A "20" when attached to "SD" (shrub, dry) means the "big sagebrush" species group (SD20).

Association codes are set off from life form by a space to emphasize that they are the classified unit. They are always numeric. An attempt is made to place associations described in a geographical area in the same first-digit code. For the example shown above, CDS6 11 is the PIPO-PSME/SYAL-HODI association. Life form and association codes are described in detail later.

Concept of Codes

Ecoclass codes not only provide a uniform means for identifying potential natural vegetation on an area but also permit addition of information on the same area as new data are obtained. For example, present timber maps or aerial photographs indicate an area in the H. J. Andrews Experimental Forest is dominated by Douglas-fir with moderately abundant western hemlock understory. The area is mapped and coded as life form CH--"C" for conifer and "H" for western hemlock--because the latter is more shade-tolerant and will eventually replace Douglas-fir as the potential natural dominant.

Let's assume that later field inspection revealed that shrubs are dominated by rhododendron with some vine maple and salal. This is the second two character code S3--"S" for shrub and "3" for the third group of shrubs--so S3 is added to CH, forming CHS3 as an ecoclass code on the map and in the TRI System.

Finally, research was published describing 18 associations on the H. J. Andrews Experimental Forest. Four could have the combination of western hemlock and rhododendron (Dyrness et al. 1974). Other ground vegetation species are used to identify the association. Salal suggests the mapping unit is the western hemlock/rhododendron/salal association, so 51 is added to CHS3. The final and most precise ecoclass code is CHS3 51: TSHE/RHMA/GASH (Appendix 5, page 136).

Ecoclass coding is based upon an open-ended system. In the first two character code, additional dominant species can be added to the present 67 types and much room is provided for adding second two character code categories to the present 550. Each life form can have as many as 100 associations (a total of 55,000 associations), of which 690 have been classified (6/88).

In addition, coding provides for situations where vegetation may not be an adequate means for identifying the biotic community. One life form is devoted to "administrative" items such as roads, compounds, residences, agricultural areas, and others. Another life form is devoted to "nonvegetated" areas such as snow fields, rock outcrops, and

sand dunes, and another deals with aquatic systems.

Coding is provided at the second-two character code level for special grouping. These groups are identified by the letters X, Y, and Z. The kinds of vegetation contained in each "X" code are noted in the description of the code (Appendix 5, page 140). For example, CLX2 20 is a special grouping used by the Winema National Forest; it is dominated by lodgepole pine and contains associations CLG3 11, CLM1 11, and CLS2 14. The group represents the most productive lodgepole pine sites on the Forest.

Ecoclass codes are stored in computer memory at Fort Collins and other computer centers. Life form can be used in two parts: the first two characters and all four characters. Error statements will be made unless the following rules are followed:

1. Always use **both** characters when using the first two and take them from Appendix 5.
2. Always use **all four** characters when adding second two character codes to the first two and take them from Appendix 5.
3. Always use codes that **conform** to those in Appendix 5.

New ecoclass codes are assigned only by the Regional Ecologist.

First Two-Character Codes

First-letter codes represent a kind of life form or, when vegetation is not the primary feature, the dominant identifying character such as nonvegetated or water. An "X" following the first letter indicates that additional description has not been made. A second letter describes the first by additional information.

Administrative or agricultural areas:

AX = Administrative or agricultural (no descriptor specified).

AB = Buildings, structures, roads, campgrounds.

AC = Cultivated land.

AG = Grassland, permanent pasture maintained in forest, shrub, or desert climates.

AO = Orchards, maintained exotic forest stands.

AR = Recreation areas such as parks, golf courses, play areas.

Coniferous forest areas:

CX = Coniferous forest (no descriptor specified).

CA = Alpine open forest park of subalpine fir, whitebark pine, mountain hemlock, alpine larch.

CC = Cedar, western red as the climax dominant; may occur as dominant reproduction under Douglas-fir.

CD = Douglas-fir as the climax dominant; may occur as dominant reproduction under itself, ponderosa pine, white pine, larch; do **not** use when reproduction under Douglas-fir is shade-tolerant fir or hemlock--instead, use CF, CH, CM, CR, CS, or CW.

CE = Subalpine fir - Engelmann spruce closed forest of commercial quality; not alpine parks; larch or white pine may dominate the overstory, lodgepole may be an important component of the overstory but fir and/or spruce clearly dominate the understory.

CF = Fir, silver or noble as the climax dominant; may occur as dominant reproduction under western hemlock, Douglas-fir, white pine, lodgepole pine; mid to upper forest zone conditions.

CH = Hemlock, western as the climax dominant; stand currently may be dominated by Douglas-fir with hemlock reproduction; Sitka spruce must be absent in the overstory and absent to minor in the understory; if spruce is common to dominant in the understory, use CS.

CJ = Juniper-dominated stands with little or no ponderosa pine.

CL = Lodgepole pine-dominated stands; lodgepole may be climax or stable successional; it must compose 100 percent of the overstory and must have minimal reproduction of other species; shore pine-dominated stands.

CM = Mountain hemlock as the dominant climax species; hemlock may occur as reproduction under noble fir, Douglas-fir, white pine, sugar pine, lodgepole pine, and sometimes under silver or Shasta red fir; upper forest zone conditions.

CP = Ponderosa pine or Jeffrey pine as climax dominant; when regeneration is dominated by firs, use CD or CW.

CR = Red fir (Shasta red) as the climax dominant; stand currently may be dominated by sugar pine, lodgepole pine, or Douglas-fir, but red fir dominates regeneration; upper forest conditions.

CS = Spruce, Sitka as the climax dominant; coastal forest conditions; spruce must dominate reproduction (if any) and/or overstory; overstory may be dominated by Douglas-fir or hemlock.

CW = White or grand fir as climax dominant; fir must dominate reproduction under ponderosa pine, Jeffrey pine, Douglas-fir, larch, white pine, sugar pine, clearly replacing lodgepole pine.

Forb (weed)-dominated areas, climax forland:

FX = Forbland (no descriptor specified).

FM = Moist (mesic) forblands within the forest zone.

FS = Subalpine or alpine forbland, sometimes eroded sites dominated by forbs.

FW = Wet forblands, forb-dominated meadows; freely available water within the rooting zone all through growing season.

Grassland climax vegetation (not successional or fire-induced grassland on sagebrush sites):

GX = Climax Grassland (no descriptor specified).

GA = Annual grassland sites; may have been perennial grass at one time but currently in near-stable annual grassland (i.e., California annual grasslands).

GB = Bunchgrass-type grasslands, forest zone or steppe vegetation; includes seeded bunchgrass vegetation as "new" potential natural vegetation.

GM = Moist (mesic) forest zone grassland, interior valley grassland.

GR = Rhizomatous grass or sedge vegetation.

GS = Subalpine or alpine grassland dominated by bunchgrasses, sedges, or other grasses.

Hardwood (broad-leaved) woodland or forest (trees taller than 16 feet at maturity):

HX = Hardwood woodland or forest (no descriptor specified).

HA = Alder(red)-dominated stands, climax or apparently stable with little fir or hemlock reproduction (shrub alder less than 16 feet tall is in shrub life form):

HB = Bigleaf maple-dominated stands, climax or apparently stable.

HC = Cottonwood, ash; bottomland, overflow bottomland.

HL = Liveoak, canyon as a tree-sized stand (over 16 feet tall); liveoak as a shrub field is contained in chaparral, use SC.

HO = Oak, Oregon white, California black as climax stand dominant or stable woodland dominant.

HQ = Quaking aspen climax stands, generally meadow vegetation in Region 6.

HT = Tanoak as a tree-sized stand (over 16 feet tall).

Meadows dominated by grass/sedge:

MX = Meadow, grass/sedge (no descriptor specified).

MD = Dry meadow; water table available only part of the growing season.

MM = Moist meadow; water table available to roots all through growing season.

MS = Subalpine or alpine moist to wet meadows as defined above.

MT = Tule meadows, standing water most or all of growing season.

MW = Wet meadow, soil surface moist to wet all through growing season.

Nonvegetated and minimally vegetated land areas (site potential supports less than 10 percent plant crown cover):

NX = Nonvegetated land, less than 10 percent crown cover potential (no descriptor specified).

NC = Cinders, lava flow, mud flow, glacial wash; continuous disturbance or low site potential precludes enough vegetation to reach 10 percent crown cover.

NF = Flood plain periodically denuded of vegetation with no foreseeable means of establishing plants.

NI = Ice fields, glaciers, perennial snow.

NL = Landform failure, natural slumps, avalanches, avalanche trails with little practical means of establishing vegetative cover.

NM = Mine tailings, dredgings, man-caused disturbance which has little current vegetation potential.

NR = Rocky land with too little soil (or no soil) for good vegetative cover.

NS = Sand with minimal vegetative cover, shoreline or interior dunes.

NT = Talus with minimal vegetative potential.

Shrubland areas with climax shrubs or apparently stable shrub dominance, (Trees less than 16 feet tall at maturity):

SX = Climax shrubland (no descriptor specified).

SC = Chaparral, evergreen shrubland within the forest and below the forest zone.

SD = Dry shrubland, sagebrush types, nonforest zone shrubs; not desert.

SM = Moist (mesic) shrubland, forest zone shrubs and shrubland.

SS = Subalpine or alpine shrubland, heather, heath.

SW = Wet shrubland, shrub meadows, willow, alder.

Tundra--Little representation in Pacific Northwest; primarily in alpine locations in the North Cascades.

TX = Tundra (no descriptor specified).

Water-covered areas:

WX = Water-covered areas (no descriptor specified).

WE = Estuary systems, interface between fresh and saline water; includes tidal-exposed areas.

WL = Lakes, ponds, impoundments; perennial or intermittent.

WO = Oceans, seas, saline water bodies of large size; salinity of lakes and ponds is treated in **WL**.

WR = Running water bodies, streams, rivers, creeks, ditches; perennial or intermittent.

Second Two-Character Codes

Groups of species are identified by the second two-characters in life form. They continue to modify information indexed by the first two, therefore all four characters must be used to prevent a computer error statement. Alphanumeric codes are used with administrative, coniferous, hardwood, and nonvegetated life form codes. Numeric codes are used with all other life forms. Appendix 5, page 119, contains all current codes.

Second two-character codes are divided into a general group (first digit) and a subdivision of the group (second digit). This stratification accomplishes two things: It permits division of life form into smaller units based upon existing data even though a detailed ecological study has not been published, and it permits an additional level for grouping within the computer.

Several special designators are used with second two-character codes. A first character "X," "Y," or "Z" indicates a special kind of criterion has been established. These are characterized by Forest and by material contained in the designation. For example, in Appendix 5, page 147, CWX1 20 is identified as "Winema (20): CWS1 12, CWS1 14," meaning that it applies to the Winema National Forest and is composed of associations CWS1

12: ABCO/CEVE-ARPA-PUM (white fir/ceanothus-manzanita, pumice) and CWS1 14: ABCO/CEVE-PUM (mixed conifer/ceanothus-pumice).

A first-character "9" means scabland or very restricted site conditions. A second-character "0" means a general category such as S0 = general shrub understory, or G0 = general grass understory.

A first-character B indicates a bisected, broken or biscuit-swale microtopographic situation which is too small to map or inventory by the individual parts. Biscuit-swale types typically occur as small mounds of good soil 1 to 3 feet high and 5 to 20 feet in diameter separated by areas of very shallow soil that range from 2 to 30 feet wide. The "B" also indicates potholes of dry/moist/wet meadow or other micro-site conditions.

The following is a list of first-character alpha codes for these second two-character codes.

- A = Alpine/subalpine conditions, used with non-vegetated types.
- B = Bisected, Biscuit-swale, or complex microsites; used with grass, shrub and meadow life forms.
- C = Conifer-dominated vegetation; with coniferous or hardwood life form codes, it indicates an important codominant associated conifer or an important short-tree conifer understory; with nonvegetated life form codes, it indicates scattered coniferous species.
- F = Forb-dominated vegetation; ground vegetation under coniferous or hardwood; scattered forbs in nonvegetated life form codes.
- G = Grass and grasslike (sedge) dominated vegetation; ground vegetation under coniferous and hardwood; scattered grass in nonvegetated life form codes.

- H =** Hardwood dominated vegetation; with coniferous or hardwood life form codes, it indicates an important associated overstory hardwood or an important short-tree hardwood understory; scattered hardwoods in nonvegetated life form codes.
- M =** Meadow vegetation; sites where plants are subirrigated part or all of the growing season, used with coniferous and hardwood forest.
- N =** No vegetation; shifting sand dunes, bare rock areas, etc.
- L =** Ledge or cliff, steeper than 200 percent (60°).
- T =** Tunnel or cave.
- D =** Dump for trash, garbage, etc.
- P =** Parking area, open storage area, large paved areas.
- R =** Road or improved vehicle travel route.
- S =** Shrub-dominated vegetation; ground vegetation under coniferous or hardwood; scattered shrubs in nonvegetated life form codes.

Examples:

- HOG2 =** Hardwood, Oregon oak or black oak, Grass ground vegetation, Grass code #2: rhizomatous grasses (HOG0 = oak/grass general group).
- HOS1 =** Hardwood, Oregon oak or black oak, Shrub ground vegetation, Shrub code #1: Oregon oak/poison oak (HOS0 = oak/shrub general group).
- CPG2 =** Conifer, Ponderosa or Jeffrey pine, Grass ground vegetation, grass code #2: ponderosa pine/pinegrass (CPG0 = pine/grass group).
- CPG6 =** Conifer, Ponderosa or Jeffrey pine, Grass ground vegetation, Grass

code #6: Jeffrey pine/bunchgrass on serpentine/gabbro.

- CPS1 =** Conifer, Ponderosa or Jeffrey pine, Shrub ground vegetation, shrub code #1: pine/sagebrush (CPS0 = pine/shrub group).
- ABA2 =** Administrative, Buildings, structures, roads, code A2: A = Aircraft facilities, 2 = runway or landing strip.

Nonvegetated

These are areas with little or no vegetation (10 percent or less potential plant crown cover). They are either too disturbed to support natural vegetation or are so geologically young that soil development has been insufficient to support significant vegetation. Examples are:

- NRN0 =** Nonvegetated, Rock, No vegetation.
- NRA2 =** Nonvegetated, Rock, Alpine code #2: grass/sedge scattered among rocks.
- Note:** "H" for Hardwood and "C" for Conifer vegetation when used with the nonvegetated life form code indicate productivity less than 20 cubic feet per acre per year and less than 10 percent crown cover.

Numeric second two-character code examples:

- GB10 =** Grass, Bunchgrass vegetation, code #10: threeawn-sand dropseed general group.
- MM10 =** Meadow Moist, code #10: tufted hairgrass moist meadow.
- FS50 =** Forbland, Subalpine, code #50: fleecflower.
- GB90 =** Grassland, Bunchgrass, code #90: general bunchgrass/scabland group.

GBB0 =	G rassland, B unchgrass, code #B0: biscuit-swale topography general group.
SD90 =	S hrubland, D ry, code #90: general shrubby scabland.
SM10 =	S hrubland, M oist, code #10: ninebark shrubland.
DC20 =	D esert, C old, code #20: shadscale.

Alpha second two-character codes:

At times, associations may be grouped together for specific purposes. One purpose is vegetation resource inventory, a broad based expansion of timber inventory (Appendix 2). In some cases, a specific kind of species as described above, is not a satisfactory code. Instead, the first character for this second two-character code is combined with a letter representing an environmental characteristic or a vegetation life form. These second letters are:

C	=	Cool
D	=	Dry
F	=	Forb
G	=	Grass
H	=	Hot
M	=	Mesic
S	=	Shrub
W	=	Wet
X	=	no additional modifier

Examples (See Appendix 2 for complete list)

CWSM	=	Conifer, White or grand fir, Shrubs, Mesic
CHSC	=	Conifer, western Hemlock, Shrubs, Cool
CHSD	=	Conifer, western Hemlock, Shrubs, Dry
CHSF	=	Conifer, western Hemlock, Shrubs and Forbs
GBFX	=	Grassland, Bunchgrasses with Forbs

Association

Associations are established, described, and characterized following formal field investigation

and office analysis, as discussed under "Ecological Classification" (p. 1). They are identified in ecoclass codes as a two-digit number following the four-character life form code. They are the only plant community units established by classification.

The term "Association" is applied to basic plant community classification types. These types have been given numerous other names, such as habitat type, phase, community type, site type, range site. Comparing the precision of these classification units, the most general would be habitat type, followed by phase, a then plant community type, with site type as most precise.

A plant association therefore does not indicate a consistent level of data accuracy or of interpretive sophistication. In fact, we should expect a continuing increase in accuracy of already established associations. For example, CPG1 11 is ponderosa pine/wheatgrass (PIPO/AGSP) of the Blue Mountains. As additional data become available, this association could be divided into: (1) ponderosa/wheatgrass/Sandberg's bluegrass (CPG1 11); (2) ponderosa/sagebrush/wheatgrass (CPS1 31); (3) ponderosa/bitterbrush/wheatgrass (CPS2 31); and (4) ponderosa/sagebrush/needlegrass (CPS1 32).

Wherever possible, the two-digit association code is divided into a primary "family" of associations (first-digit) and a specific kind of association (second-digit). For example, estuarine systems developed in sand dune geology are divided into several kinds, as follows: WE13 10 = water, estuary, 1 = bar formation, 3 = conditions where fresh and saline water are well mixed, 10 = general category for tidal exposed sandy bottom. WE13 11 means tidal-exposed sandy bottom, active flood plain (Appendix 5). Other general kinds of associations are WE13 20 = estuary, bar-built, well-mixed saline, tidal-exposed clay bottom; and WE13 30 = estuary, bar-built, well-mixed saline, tidal-exposed stony bottom.

All association codes are identified in one of two ways: citing the published reference or naming the National Forest for in-service publication. Published references are listed with their abbreviations on page 122 of Appendix 5.

Examples:

CAG1 11 = Coniferous vegetation, Alpine conditions of subalpine fir, whitebark pine, mountain hemlock open parks; Grass species group code 1 (sedge-dominated vegetation); **association** 11: subalpine fir-white-bark pine/sedge in the Blue Mountains, described in the publication R6 Area Guide 3-1; coded as:

CAG1 11 ABLA-PIAL/CAGE: subalpine fir-whitebark pine/elk sedge, R6 AG 3-1.

GB49 13 = Grass vegetation, Bunchgrass type; species group code 49 (wheatgrass-dominated vegetation); **association** 13: bunchgrass growing on shallow soil (8-14 inches deep) on steep slopes (over 25 percent) in the Blue Mountains, described in the publication R6 Area Guide 3-1, coded as:

GB49 13 AGSP/POSA3-SHAL/STP: bunchgrass, shallow soil, steep, R6 AG 3-1.

GR82 12 = Grass vegetation, Rhizomatous grass or sedge; species group code 82 (80 is beachgrass general group, so any 80 series is related to beachgrass--82 is beachgrass growing on hummocks on the land side of coastal foredunes); **association** 12: occasionally wet hummocks that are unstable due to partial cover of beachgrass which also has coastal lupine growing with it, along the Oregon coast, described in in-service material on the Siuslaw National Forest; coded as:

GR82 12 Hummocks, occ. wet, unstable: open beachgrass/lupine, Sius.

NCS1 11 = Nonvegetated or minimally vegetated areas with less than 10 percent plant crown cover potential, Cinder, lava flow, or glacial wash; shrub group code S1, Shrubs dominating what little vegetation is present, 1 is vine maple as dominant shrub;

association 11: lava flows with vine maple and lace lipfern colonizing occasional soil pockets on the Willamette National Forest, described in the plant association guide R6 Ecol 257-86; coded as:

NCS1 11 SHRUB(LAVA): Lava flows - scattered vine maple, R6 E 257-86

SD33 11 = Shrub vegetation, Dry shrubland dominated by species not restricted to the forest zone; species group code 33 (30 is the general category of bitterbrush shrubland, 33 is bitterbrush on coarse-textured, easily eroded pumice); **association** 11: bitterbrush/needlegrass on pumice soils in the Deschutes-Winema-Fremont area, described in the plant association guide R6 Ecol 104-85; coded as:

SD33 11 PUTR/STOC-PUM: bitterbrush/needlegrass-pumice, R6 E 104-85.

Appendix 5 is a complete listing of all ecoclass codes.

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APPENDIX 1

Ecoclass Nomenclature--Cross-Reference

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Ecoclass Nomenclature--Cross-Reference

Wetland Vegetation

MD	Dry meadow
MM	Moist meadow
MS	Subalpine, alpine moist and wet meadow
MT	Tule meadow
MW	Wet meadow
CCM1	Western red cedar/skunk cabbage
CCM2	Western red cedar/sedge
CCM3	Western red cedar-lodgepole/Labrador tea (coastal)
CEM1	Subalpine fir-Engelmann spruce/grass-sedge meadow
CEM2	Subalpine fir-Engelmann spruce/forb meadow
CEM3	Subalpine fir-Engelmann spruce/short shrub meadow
CFM1	Silver, noble fir/skunk cabbage
CHM1	Western hemlock/skunk cabbage
CLM1	Lodgepole pine/tall sedge-grass
CLM2	Lodgepole pine/dwarf shrub-grass
CLM3	Lodgepole pine/low huckleberry-grass
CLM9	Lodgepole pine-spruce/few flowered spikerush
CPM1	Ponderosa pine/wildrye-bluegrass
CPH3	Ponderosa pine-quaking aspen
CSM1	Sitka spruce/willow-waxmyrtle
CWM1	White fir/alder/snowberry shrub meadows
CWH2	White fir-quaking aspen
FW10	Cowparsnip wet forbland
FW20	Cottonsedge-sphagnum-sedge wet meadow
FW30	Camas moist to wet meadow
FW40	Groundsel, beadlily wetlands
FW50	False hellebore wetlands
FS20	Subalpine-moist: lupine-indian paintbrush-buttercup
FS30	Subalpine-wet: saussurea-monkeyflower-marshmarigold
HAM1	Red alder overflow bottomland
HAM2	White alder overflow bottomland
HBM1	Bigleaf maple overflow bottomland
HCG0	Cottonwood, ash bottomland with sedge, grass

HCS1	Cottonwood-willow bottomland
HCS2	Ash-willow bottom, overflow bottom
HQM1	Quaking aspen/bluegrass moist meadow
HQM2	Quaking aspen/tall sedge moist meadow
HQM3	Quaking aspen/short sedge moist meadow
HQM4	Quaking aspen/shrub meadow
SW10	Willow meadow
SW20	Alder meadow
SW30	Hawthorn meadow
SW40	Spiraea, blueberry wetlands
SW80	Coastal shrub meadow
WE13 59	Estuarian vegetated flats (eelgrass meadow) exposed at low tide

Extremely poor sites (scabland, serpentine, etc.)

NX	All N (nonvegetated types)
CJS8	Juniper/rigid sage scabland
CLC2	Lodgepole pine-Douglas-fir, serpentine
CPG6	Jeffrey pine on serpentine, gabbro
FM90	Forb scabland (buckwheat, etc.)
GB90	Bunchgrass scabland (bluegrass-oatgrass)
GS40	Subalpine-alpine short, thin sedge
SD91	Rigid sage scabland
SD92	Low sage scabland
SD93	Shrubby eriogonum scablands
SM90	Moist (mesic) shrub scabland

Low-productivity forest types (less than 25 cubic feet per acre per year)

CA	All open parks of Subalpine fir, mountain hemlock, whitebark pine
CDG3	Douglas-fir/bunchgrass
CJ	All juniper types
CLC1	Lodgepole pine-whitebark pine, alpine
CLC2	Lodgepole pine-Douglas-fir on serpentine
CLG3	Lodgepole pine/needlegrass basins, pumice
CLS1	Lodgepole pine/big sagebrush
CLS3	Lodgepole pine/pinemat manzanita/needlegrass, pumice

CLS8 31	Rolling dune: open lodgepole/kinnikinnick-hairy manzanita
CPC2	Ponderosa pine-juniper
CPG1	Ponderosa pine/bunchgrass, nonpumice
CPG6	Jeffrey pine/grass, serpentine
CPS1	Ponderosa pine/big sagebrush
HL	Canyon liveoak
HOG1	Oregon or black oak/bunchgrass
HOG3	Oregon or black oak/annual grass
HOS1	Oregon or black oak/poison oak
HOS6	Oregon or black oak/bitterbrush
NCC1	Cinders, glacial outwash with scattered subalpine fir, whitebark pine
NCC2	Cinders, glacial outwash with scattered mountain hemlock
NCC3	Lava flow, glacial outwash with scattered Douglas-fir, true fir
NCC4	Lava flow, mud flow with scattered Douglas-fir and oak
NCC5	Cinders, lava with lodgepole pine
NCC6	Glacial alluvial flows with lodgepole pine
NCH1	Mud, glacial flows with alder, willow, aspen
NMC1	Mine tailings, dredgings with scattered lodgepole pine
NMH1	Mine tailings, dredgings with scattered cottonwood
NMH2	Mine tailings, dredgings with scattered aspen
NRA1	Alpine rocky land with scattered whitebark pine, Subalpine fir, mountain hemlock
NTA1	Alpine talus slopes with scattered whitebark pine, Subalpine fir, mountain hemlock
NTCO	Talus slopes with scattered conifers
NTH1	Talus slopes with scattered bigleaf maple
NTH2	Talus slopes with scattered Oregon or black oak

Coastal sand dune conditions

CLS8 11	Deflation plain: lodgepole/salal-evergreen huckleberry/sedge
CLS8 12	Floodplain dune: lodgepole/rhododendron/evergreen huckleberry
CLS8 21	Stabilized dune: lodgepole/rhododendron/evergreen huckleberry
CLS8 22	Eroding dune: lodgepole/rhododendron/evergreen huckleberry
CLS8 23	Dune slip face: lodgepole/rhododendron/evergreen huckleberry
CLS8 31	Rolling dune: open lodgepole/kinnikinnick-hairy manzanita
CSS4 11	Stabilized dune: Sitka spruce-D.fir/rhododendron/evengreen huckleberry
CSS4 12	Flood plain: Sitka spruce-lodgepole-W. hemlock/rhododendron
CSS4 21	Sandy, steep slope; Sitka spruce-D. fir/rhododendron/evergrn huck
CSS4 22	Sandy, gentle slope: Sitka spruce-D. fir/rhododendron/evergrn huck
GR81	Foredune (sandy dune geology, grass)
GR81 11	Foredune: beachgrass, coastal

GR82	Hummocks (sand dune geology, grass)
GR82 11	Hummocks, occ. wet: dense beachgrass-lupine-bluegrass, coastal
GR82 12	Hummocks, occ. wet, unstable: open beachgrass-lupine, coastal
GR82 13	Hummocks, dry, eroding: beachgrass-lupine-bluegrass, coastal
GR83	Dune slip face: beachgrass
GR83 11	Dune slip face: beachgrass, stabilized, coastal
MM98 11	Deflation plain potholes: red fescue-brown rush-slough sedge
MT81 11	Coastal: cattail-bulrush/water lily-waterweed
MW81 11	Coastal: valley fill: slough sedge/skunk cabbage-red currant
MW81 12	Coastal: slough sedge/water lily-pondweed-cattail
NSG8	Coastal sand dune, rolling, partial beachgrass stability
NSN1 11	Pacific Coast beach, Siuslaw NF
NSN2	Transverse ridge sand dune system
NSN2 11	Transverse ridge, occ. wet, winter stable, coastal
NSN2 12	Transverse ridge, dry, moving sand, coastal
NSN3	Oblique ridge, sand dune system
NSN3 11	Oblique ridge, fore slope moving sand, coastal
NSN3 12	Oblique ridge, precipitation ridge, active sand, coastal
NSN3 13	Oblique ridge, precipitation ridge, active, threatening vegetation
NSN4	Parabola sand dune system
NSN0	Open sand of any dunal character
SW81	Coastal shrubs in a deflation plain
SW81 11	Deflation plain, high water: willow-waxmyrtle, salal, pine
SW81 12	Deflation plain, high water: salal-evergreen huckleberry, willow
WE13 11	Active flood plain, stream deposits, tidal flooding, Siuslaw NF
WE13 19	Estuarian, exposed sandy bottom at low tide
WE13 59	Tidal salt marsh, eelgrass, exposed at low tide

Alpine and Subalpine

CA	All Subalpine fir, whitebark pine, mountain hemlock open parks
CLC1	Lodgepole pine, whitebark pine, alpine
CLC5	Lodgepole pine-mountain hemlock
FS	All subalpine forb fields, alpine forb fields
GS	All subalpine or alpine grassland
MS	All subalpine or alpine moist to wet meadows
NI	Ice fields, glaciers
NCA0	Nonvegetated cinders, lava fields in alpine conditions (NCA1, A2, A3, A4)
NCC1	Nonvegetated cinders, lava fields with Subalpine fir, whitebark pine
NCC2	Nonvegetated cinders, lava fields with mountain hemlock

NRA0	Rocky land in alpine, subalpine locations (NRA1, A2, A3, A4)
NTA0	Talus slopes in alpine or subalpine locations (NTA1, A2, A3, A4)
SS	All subalpine and alpine shrubland
TX	Tundra
WL69	All WL types--lakes with ice cover longer than 210 days
WR19	All WR types--rivers with mean annual temperature less than 45°F

USDA Forest Service Standard Range Types

1 (Grasslands)	GX	All grassland designations
2 (Meadows)	MX	All meadow designations
	FW	All forb-dominated wetlands
	SW	All shrub-dominated wetlands
3 (Forbs)	FX	All forb designations
4 (Sagebrush)	SD10	Low sagebrush
	SD20	Big sagebrush
	SD70	Rabbitbrush
	SD90	Scabland sagebrush
	SDB0	Biscuit-scabland sagebrush
	SS40	Subalpine sagebrush
5 (browse)	SD30	Bitterbrush
	SD40	Mountain mahogany
	SD80	Snowberry-cherry-rose
	SM30	Cherry-mockorange-serviceberry-rose-oceanspray
6 (coniferous)	CA	Subalpine fir, whitebark pine open parks
	CDG0	Douglas-fir with grass-dominated ground vegetation
	CDS4	Douglas-fir with ceanothus-manzanita
	CDS6	Douglas-fir with spiraea-snowberry
	CDS7	Douglas-fir with ninebark
	CLC1	Lodgepole pine-whitebark pine, alpine
	CLG0	Lodgepole pine with grass-dominated ground vegetation
	CLM0	Lodgepole pine meadows
	CLS1	Lodgepole pine with sagebrush
	CLS2	Lodgepole pine with bitterbrush
	CP	All ponderosa pine or Jeffrey pine
	CWC1	White fir-incense cedar-pine
	CWC2	White fir-Douglas-fir-ponderosa pine
	CWC4	White fir-ponderosa-white or sugar pine
	CWG1	Grand fir/pinegrass-elk sedge

	CWH2	White fir-quaking aspen
	CWM1	White fir/alder/snowberry-shrub meadows
	CWS1 13	ABCO/ARPA-SYAL/CAPE
	CWS1 15	ABCO/CEVE/CAPE
	CWS3 21	ABGR/SPBE
7 (Nonrange coniferous)	CX	Types not listed above or under juniper
8 (rock)	NX	Nonvegetated land
9 (juniper)	CJ	All juniper
10 (broad- leaved)	HX	All hardwood

Society of American Foresters Cover Types (1980 edition)

205	CM	Mountain hemlock (mountain hemlock)
206	CE	Engelmann spruce-subalpine fir (Subalpine fir, Engelmann spruce closed forest)
207	CR	Red fir (Shasta red)
208	CA	Whitebark pine (Subalpine fir, whitebark pine, mountain hemlock open parks)
209	none	Bristlecone pine (none in the Pacific Northwest)
210	CD CW	(some) Interior Douglas-fir (Douglas-fir), seral in: (some) White, grand fir
211	CW	(some) White fir (white, grand fir)
212	CD CE CW	Western larch, seral in: Douglas-fir Subalpine fir-Engelmann spruce (some) White, grand fir
213	CW CH CC	Grand fir (white, grand fir), often seral in: Western hemlock Western red cedar
214		(eliminated in the 1980 edition)

215		Western white pine, seral in:
	CW	White or grand fir
	CF	Silver, noble fir
	CR	Shasta red fir
	CH	Western hemlock
	CC	Western red cedar
	CE	Subalpine fir-Engelmann spruce
216	none	Blue spruce (none in the Pacific Northwest)
217	HQ	Quaking aspen (quaking aspen)
	CLH1	Lodgepole pine-quaking aspen
	CPH3	Ponderosa pine-quaking aspen
	CWH2	White fir-quaking aspen
218	CL	Lodgepole pine (lodgepole pine climax), also seral in:
	CC	Western red cedar
	CE	Subalpine fir-Engelman spruce
	CR	Shasta red fir
	CW	White, grand fir
	CF	Silver, noble fir
219	none	Limber pine (none in the Pacific Northwest)
220	none	Rocky Mountain juniper (none in the Pacific Northwest)
221	HA	Red alder (alder climax or stable), seral in:
	CC	Western red cedar
	CH	Western hemlock
	CS	Sitka spruce
222	HC	Black cottonwood-willow (cottonwood-ash bottomland)
223	CS	Sitka spruce (Sitka spruce)
224	CH	Western hemlock (western hemlock)
225	CH	Western hemlock-Sitka spruce (western hemlock)
	CS	Sitka spruce
226	CF	Coastal true fir-hemlock (silver, noble fir)
227	CC	Western red cedar-western hemlock (western red cedar)
	CH	(some) Western hemlock
228	CC	Western red cedar
229	CD	Pacific Douglas-fir, (Douglas-fir), seral in:
	CC	Western red cedar
	CH	Western hemlock
	CF	Silver, noble fir
	CW	(some) white, grand fir

230	CH CC CF	Douglas-fir-western hemlock (western hemlock) (some) Western red cedar (some) Silver, noble fir
231	CDC1 CHC1 CT CWC6	Port Orford cedar (Douglas-fir-Port Orford cedar) Western hemlock-Port Orford cedar Port Orford Cedar White fir-port orford cedar
232	CDC6 HTC1	Redwood (Douglas-fir-redwood) Tanoak-redwood-Douglas-fir
233	HO CDH3 CPH2	Oregon white oak (Oregon white, California black oak) (Douglas-fir/white oak) (Ponderosa, Jeffrey-oak)
234	HM HT CDH1 CDH2 CHH1 CPH1	Douglas-fir-tanoak-Pacific madrone (madrone) Tanoak Douglas-fir/tanoak Douglas-fir/madrone Western hemlock-tanoak-laurel Ponderosa-Jeffrey-madrone
235	HC	Cottonwood-willow (cottonwood-ash bottomland)
236	none	Bur oak (none in the Pacific Northwest)
237	CP CD CW	Interior ponderosa pine, (ponderosa, Jeffrey pine), seral in: (some) Douglas-fir (some) White, grand fir
238	CJ	Western juniper (juniper)
239	none	Pinyon-juniper (none in the Pacific Northwest)
240	none	Arizona cypress (none in the Pacific Northwest)
241	none	Western live oak (none in the Pacific Northwest)
242	none	Mesquite (none in the Pacific Northwest)
243	CDC2 CDC3 CDC1	Sierra Nevada mixed conifer (Douglas-fir, sugar pine S.W. Ore) Douglas-fir-incense cedar, S.W. Ore Ponderosa pine, incense cedar
244	CDC5	Pacific ponderosa pine-Douglas-fir (Douglas-fir-ponderosa S.W. Ore.)
245	CPH1 CPH2 CPS6	Pacific ponderosa pine (ponderosa, Jeffrey-madrone) Ponderosa pine, Jeffrey-oak Ponderosa/manzanita-deerbrush

246	HO CDH2 CPH2	California black oak, (Oregon white, California black oak), seral in: Douglas-fir-white oak Ponderosa-oak
247	CP CDC5 CPC1 CPG6	Jeffrey pine (ponderosa, Jeffrey pine) Douglas-fir-ponderosa pine, Jeffrey pine Ponderosa pine, Jeffrey - incense cedar Jeffrey pine-serpentine/gabbro-grass
248	none	Knobcone pine (too little to assign)
249	HL	Canyon liveoak (over 16 feet tall) (canyon liveoak)
250	none	Digger pine-oak (none in the Pacific Northwest)
255	none	California coast liveoak (none in the Pacific Northwest)

Kuchler Types: Potential Natural Vegetation (See Appendix 3)

Map dated			
1969	1964		
K1	K1	CS	(all) Spruce-cedar-hemlock forest (Sitka spruce)
K2	K2	CH	Cedar-hemlock-Douglas-fir forest (coast, Cascades) (some western hemlock)
		CC	Some Western red cedar
K3	K3	CF	(all) Silver fir-Douglas-fir forest (silver, noble fir)
K4	K4	CM	(all) Fir-hemlock forest (mountain hemlock)
		CE	(some) Subalpine fir, Engelmann spruce closed forest
K5	K5		Mixed conifer forest (southwestern Oregon-northern California)
		CDC1	Douglas-fir - Port Orford cedar/yew
		CDC2	Douglas-fir - sugar pine, SW Oregon
		CDC3	Douglas-fir - incense cedar, SW Oregon
		CDC5	Douglas-fir - ponderosa pine, southern Oregon
		CDS4	Douglas-fir/ceanothus-manzanita
		CPC1	Ponderosa pine, Jeffrey-incense cedar
		CWC1	White fir-incense cedar
		CWC2	White fir, Douglas-fir, ponderosa pine
K6	K6		Redwood forest
		CDC6	Douglas-fir-redwood
		HTC1	tanoak-redwood-Douglas-fir
K7	K7	CR	(all) Red fir forest (red fir, Shasta red)

Map dated			
1969	1964		
K10	K10		Ponderosa shrub forest
		CPC1	Ponderosa, Jeffrey-incense cedar
		CPC2	Ponderosa, juniper
		CPC3	Ponderosa, lodgepole pine
		CPS1	Ponderosa, Jeffrey/big sagebrush
		CPS2	Ponderosa, Jeffrey/bitterbrush
		CPS3	Ponderosa/ceanothus
		CPS4	Ponderosa/oceanspray-cherry tall shrub
		CPS5	Ponderosa/snowberry-spiraea
		CPS6	Ponderosa/manzanita-deerbrush
		CPS7	Ponderosa/ninebark
		CPS0	Ponderosa, Jeffrey with shrub-dominated ground vegetation
K10	K11		Western ponderosa forest
		CPG1	Ponderosa/bunchgrass -- nonpumice
		CPG2	Ponderosa/rhizomatous grass-sedge
		CPG3	Ponderosa/bunchgrass -- pumice soil
		CPG6	Jeffrey pine -- serpentine/gabbro bunchgrass
		CPM1	Ponderosa, Jeffrey/wildrye-bluegrass
		CPMX	Ponderosa meadows
K11	K12		Douglas-fir forest
		CDF1	Douglas-fir/beargrass
		CDF2	Douglas-fir/twinflower
		CDG1	Douglas-fir/pinegrass-elk sedge (often with ponderosa pine)
		CDG2	Douglas-fir/blue wildrye
		CDG3	Douglas-fir/bunchgrass
		CDG8	Douglas-fir/subalpine sedge
		CDS2	Douglas-fir/oceanspray-vine maple-salal
		CDS4	Douglas-fir/ceanothus, manzanita
		CDS6	Douglas-fir/spiraea-snowberry-oceanspray
		CDS7	Douglas-fir/ninebark
		CDS8	Douglas-fir/big huckleberries
K12	K13		Cedar-hemlock-pine forest (northern Rocky Mountains)
		CCF1	Red cedar/ladyfern
		CCF2	Red cedar/beadlily
		CCS2	Red cedar/devil's club
		CCS3	Red cedar/pachistima
		CHC4	Western hemlock/red cedar
		CHS6	Western hemlock/pachistima
K13	K14		Grand fir-Douglas-fir forest
		CW	(most) white, grand fir
K14	K15	CE	(all) Western spruce-fir forest (Subalpine fir - Engelmann spruce)
K49	K24	CJ	(all) Juniper steppe woodland (juniper)

Map dated			
1969	1964		
K89	K25	HC HAM1 HAM2 HAM0 HBM1	(all) Alder-ash forest (cottonwood, ash, bottomland) Alder-overflow bottomland (<i>Alnus rubra</i>) Alder-overflow bottomland (<i>Alnus rhombifolia</i>) Alder meadows (moist or wet) Bigleaf maple overflow bottomland
K22	K26	HO	(all) Oregon oakwoods
K25	K29		California mixed evergreen forest (madrone, chinquapin, tanoak, canyon liveoak-California laurel, Douglas-fir)
		CDH1	Douglas-fir/tanoak
		CDH2	Douglas-fir/madrone
		CDH3	Douglas-fir/white oak
		CDH4	Douglas-fir/bigleaf maple
		CDH5	Douglas-fir/chinquapin
		CDH6	Douglas-fir/California laurel
		CDS1	Douglas-fir/canyon liveoak
		HL	(all) Canyon liveoak (over 16 feet tall)
		HM	(all) Madrone
		HTS1	Tanoak/evergreen huckleberry
K29	K33	SC	(all) Chaparral (chaparral, evergreen shrubland)
K29	K34	SC	(all) Montane chaparral: (chaparral, evergreen shrubland)
K31	K37	SD49	Mountain mahogany - oak scrub (mountain mahogany)
K34	K40	DC	(all) Saltbush - greasewood (cold desert)
K42	K49	MT	(all) Tule marshes (tule meadows-standing water)
K43	K50		Fescue - wheatgrass
		GB50	Idaho fescue dominant
		GB60	Rough fescue dominant
K44	K51		Wheatgrass - bluegrass
		GB11	Threeawn - sand dropseed dominant
		GB21	Needlegrass dominant
		GB30	Squirreltail dominant
		GB40	Bunchgrass dominated by wheatgrasses
		GB41	Bluebunch wheatgrass dominant
		GB42	Whitmar wheatgrass (seeded or native) dominant
		GB43	Crested wheatgrass (seeded) dominant
		GB90	Bunchgrass scabland
		GB91	Bluegrass scabland
		GBB0	Biscuit-scabland, grass dominant
		GBC0	Bunchgrasses with a few scattered conifers
		GBS0	Bunchgrasses with a few scattered shrubs

Map dated
1969 1964

K45	K52		Alpine meadows and barren
		CA	(all) Subalpine fir, Mtn. hemlock, whitebark pine open parks
		FS	(all) Subalpine forb fields, alpine forb fields
		GS	(all) Subalpine or alpine grassland
		MS	(all) Subalpine or alpine moist to wet meadows
		NCA1	Alpine trees scattered on cinders, lava flow
		NCA2	Alpine grasses scattered on cinders, lava flow, glacial wash
		NCA3	Alpine dwarf juniper on cinders, lava, pumice
		NCA4	Alpine, steep cinders - hulsea
		NCC1	Subalpine fir, whitebark pine, on cinders, lava flow
		NCC2	Mountain hemlock on cinders, lava flow
		NI	(all) Ice fields, glaciers, ice-dominated land
		NRA1	Rocky land with alpine trees
		NRA2	Rocky land with alpine grasses or sedges
		NRA3	Rocky land with alpine juniper
		NRA4	Rocky land with alpine forbs
		NTA1	Talus land with alpine trees
		NTA2	Talus land with alpine grass, sedge
		NTA3	Talus land with alpine juniper
		NTA4	Talus land with alpine forbs
		SS	(all) Subalpine and alpine shrubland
K49	K55	SD	(all) Sagebrush steppe (dry shrubland, sagebrush)

No Kuchler Types For:

AX	Administrative sites
CL	Climax or stable-state lodgepole pine
FM	Moist (mesic) forblands in the forest zone
FW	Wet forblands, forb meadows
GA	Annual grass vegetation
GM	Moist (mesic) grassland within the forest zone
GR	Rhizomatous grass or sedge vegetation
HQ	Quaking aspen forest and meadows
MD	Dry meadows (water table available part of growing season)
MM	Moist meadows (water table available all growing season)
MW	Wet meadows (surface moist to wet all growing season)
NX	Most nonvegetated types below alpine and subalpine
SM	Moist (mesic) shrubland, forest zone shrubs and shrubland
SW	Wet shrublands, shrub meadows
WX	Water areas

Wildlife Habitat Cross Reference

Wildlife Habitats in Managed Forests: the Blue Mountains of Oregon and Washington.
Thomas, Jack Ward. 1979. (Tech. Ed.), USDA Hndbk No. 553, Washington, D.C. 512 pp, illus.

Plant Community		Plant Association
Sagebrush-bitterbrush	SD91 11	Stiff sage scabland
	SD19 11	Low sagebrush/bunchgrass
	SD29 11	Big sagebrush/bunchgrass
	SD39	Bitterbrush/bunchgrass

Western juniper	CJG1 11	Juniper/bunchgrass
	CJS8 11	Juniper/stiff sage scabland
	CJS1 11	Juniper/low sagebrush/bunchgrass
	CJS2 11	Juniper/big sagebrush/bunchgrass

Ponderosa pine	CPG1 11	Ponderosa pine/wheatgrass
	CPG1 12	Ponderosa pine/Idaho fescue
	CPS2 21	Ponderosa pine/bitterbrush/Ross' sedge
	CPM1 11	Ponderosa pine/blue wildrye

Mixed conifer	CDG1 11	Ponderosa pine-Douglas-fir/elk sedge
	CDS6 11	Ponderosa pine-Douglas-fir/snowberry/oceanspray
	CDS7 11	Ponderosa pine-Douglas-fir/ninebark
	CWG1 11	Grand fir/pinegrass - residual soil
	CWG1 12	Grand fir/pinegrass - ash soil

White (grand) fir	CWF3 11	Grand fir/twinflower-forb
	CWS2 11	Grand fir/big huckleberry
	CWS8 11	Grand fir/grouse huckleberry

Subalpine fir	CES3 11	Subalpine fir/big huckleberry
	CES5 11	Subalpine fir/grouse huckleberry
	CAG1 11	Subalpine fir-whitebark pine/elk sedge

Lodgepole pine	CLG2 11	Lodgepole pine/pinegrass-grouse huckleberry
	CLS5 11	Lodgepole pine/big huckleberry
	CLS4 11	Lodgepole pine/grouse huckleberry

Other shrubs	SM31	Snowberry shrubfields
	SM19	Ninebark shrubfields
	SM29	Thinleaf alder snowslides

Curleaf mountain mahogany	SD49	Mountain mahogany/grass
Dry meadow	MD	Dry meadow
Moist meadow	MM MW	Moist meadow Wet meadow
Quaking aspen	HQM1	Quaking aspen meadow
Other grasses	GB49 11 GB49 12 GB49 13 GB49 14 GB91 11 GBB9	Bunchgrass, shallow soil, gentle slopes Bunchgrass, deep soil, gentle slopes Bunchgrass, shallow soil, steep slopes Bunchgrass, deep soil, steep slopes Bluegrass scabland Biscuit-scabland
Alpine meadows	CAG1 11 SS49 11 GS12 11 GS39 11 FS59 11	Subalpine fir-whitebark pine/elk sedge Subalpine sagebrush Subalpine Idaho fescue Subalpine elk sedge Subalpine fleecflower

Management of Wildlife and Fish Habitats in Forests of Western Oregon and Washington.
Brown, E. Reade. 1985. (Tech. Ed.), USDA Forest Service, Pacific N.W. Region.
Part 1 - Chapter Narratives. 332 pp, illus.

Plant Community		Ecoclass Life Forms
Herbaceous wetland	MD MM MW MT FW10 FS20 FS30	Dry meadows Moist meadows Wet meadows Tule meadows Wet forbland Subalpine - moist: lupine-Indian paintbrush Subalpine-wet: saussurea-monkeyflower.

Hardwood-shrubby wetland	HAM1	Red alder overflow bottomlands
	HAM2	White alder overflow bottomlands
	HCS1	Cottonwood-willow bottomlands
	HCS2	Ash-willow bottomlands
	HBM1	Bigleaf maple overflow bottomlands
	SW	Shrub wetlands
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Coniferous wetland	CCM0	Western red cedar/wetland
	CHM0	Western hemlock/skunk cabbage wetland
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Grass-forb dry hillsides	AG	Administrative, permanent pasture
	GA	Annual grassland
	GM	Mesic grassland within the forest zone
	GMC9	Mesic grassland with scattered conifers
	GMS9	Mesic grassland with scattered shrubs
	GB	(some) Bunchgrass grassland (only some types)
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Mountain shrubland and chaparral	SC	Chaparral (all)
	SM	Moist (mesic) shrubland within the forest zone
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Deciduous hardwood forest	HB	Bigleaf maple
	HO	Oregon white oak, California black oak
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Evergreen hardwood forest	HL	Canyon liveoak over 16 feet tall
	HM	Madrone
	HT	Tanoak over 16 feet tall
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Red alder forest	HA	Red alder (as a climax dominant)
	CC	Red cedar-alder is seral in this type
	CH	Western hemlock-alder is seral in this type
	CS	Sitka spruce-alder is seral in this type
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Conifer-hardwood forest	CDH9	Douglas-fir with associated hardwoods
	CHH9	Western hemlock with associated hardwoods
	CPH9	Ponderosa or Jeffrey pine with hardwoods
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Mixed conifer forest	CDC9	Douglas-fir with associated conifers
	CPC9	Ponderosa pine with associated conifers
	CHC9	Western hemlock with associated conifers
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Temperate conifer forest	CC	Western red cedar
	CDS1	Douglas-fir/canyon live oak
	CDS2	Douglas-fir/oceanspray-vine maple-salal
	CDS3	Douglas-fir/rhododendron-hazel-dogwood
	CDS5	Douglas-fir/poison oak-rose
	CH	Western hemlock
	CW	(some) White (grand) fir in westside conditions
	CS	Sitka spruce
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High temperate conifer forest	CE	(some) Subalpine fir-Engelmann spruce--westside only
	CF	Silver and noble fir
	CM	Mountain hemlock
	CR	Shasta red fir
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Subalpine forest parks	CA	Subalpine fir, whitebark pine, Mtn. hemlock parks
	FS	Subalpine forb fields
	GS	Subalpine and alpine grassland
	MS	Subalpine and alpine meadows (subirrigated)
	SS	Subalpine and alpine shrub fields
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Lodgepole pine	NOTE: lodgepole pine is successional in these life forms:	
	CA	Subalpine fir, whitebark pine open parks
	CE	Subalpine fir-Engelmann spruce
	CF	Silver or noble fir
	CM	Mountain hemlock
	CF	Shasta red fir
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Shore pine	CLS8	Shore pine/salal-huckleberry
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APPENDIX 2

Stratification for Vegetation Resource Inventory

Status as of 11/21/88

Stratification for Vegetation Resource Inventory

In 1988, the Regional Office finalized a complete revision of timber inventory. It was expanded to include information on other characteristics of forest stands such as dead and down woody material, snags, and identification of old growth. It also was designed to identify all areas on a National Forest whether they were forested or not. And in addition, the sampling system was changed from a systematic grid to stratified sampling on a pre-mapped base.

The Region's ecology program cooperated in developing response units (mapping units) to meet specific inventory objectives. Important objectives were: (1) Similarity in species dominance, (2) Similarity in environmental characteristics such as hot and dry or cold and wet, (3) Similarity in management opportunities or limitations such as regeneration problems, (4) Similarity in productivity within rather broad classes, and (5) Characterization of non-forested resources.

The stratification is broadly subdivided into nonforested association groups and forested association groups. The non-forested strata are further subdivided by lifeform such as grasslands,

meadows, shrublands. The forested strata are subdivided into tree series. The series is a taxonomic level of a classification which represents groups of associations which have the same climax tree species.

Associations are grouped within each of the series according to similarity in species composition, environmental indicators, and/or management significance. Each association group (or response unit) is identified with a boldface label and a four digit ecoclass mapping code. Beneath each boldface label and mapping code is a paragraph describing the broad characteristics of the response unit.

Following the response unit description are three columns of information which identify the plant associations which comprise that response unit. The left most column lists the plant associations in scientific abbreviation. As slash (/) separates species of different lifeforms [trees/shrubs/herbs] and a dash (-) separates species of the same lifeform. The center column lists the specific ecoclass code for the individual plant association. The right most column lists the abbreviation of the National Forests on which the association can be found.

Non-Forested Vegetation Stratification

GRASSLANDS

GREEN FESCUE

(GS11)

Xeric grasslands dominated by green fescue (FEVI) which occur at high elevations in the Cascade and Wallowa Mountains while nonforested peaks in Blue Mountains are dominated by Idaho fescue (FEID). Soils generally well-drained and warm but with opportunity for frost anytime during growing season:

FEVI-CAHO	GS11 11	WAW
FEVI-LULA2	GS11 12	WAW
FEVI-GRASS	GS11	PUM
FEID (Alpine)	GS12 11	OCH,MAL,UMA,WAW

IDAHO FESCUE

(GB50)

Associations dominated by Idaho fescue (FEID) with bluebunch wheatgrass (AGSP), prairie junegrass (KOCR), elk sedge (CAGE), one-spike oatgrass (DAIN) as codominants or subordinates. Xeric grasslands with shallow to moderately deep, often stony soils and occurring on gentle to very steep slopes with a north or east aspect:

FEID-KOCR (Ridge)	GB59 11	WAW,UMA
FEID-KOCR (Mound)	GB59 12	WAW,UMA
FEID-KOCR (High)	GB59 19	WAW
FEID-KOCR (Low)	GB59 14	WAW
FEID-AGSP (Ridge)	GB59 15	WAW
FEID-AGSP/LUSE	GB59 16	WAW
FEID-AGSP/BASA	GB59 17	WAW
FEID-AGSP/PHCO2	GB59 18	WAW
FEID-CAHO	GB59 21	WAW
FEID-CAGE	GB59 22	WAW
FEID-DAIN-CAREX	GB59 20	WAW
BUNCHGRASS (Deep-Gentle)	GB49 12	OCH,MAL,UMA,WAW
BUNCHGRASS (Deep-Steep)	GB49 14	OCH,MAL,UMA,WAW
FEID-SYAL/KOCR	GB59 19	WAW

BLUEBUNCH WHEATGRASS

(GB41)

Xeric grasslands dominated by bluebunch wheatgrass (AGSP) often associated with Sandberg bluegrass (POSA3). Soils well drained, stony. Slopes gentle to steep often facing southeasterly to westerly:

AGSP/ERHE	GB41 11	WAW
AGSP-POSA3/SCAN	GB41 12	WAW
AGSP-POSA3 (Basalt)	GB41 13	WAW
AGSP-POSA3/ASCU4	GB41 14	WAW
AGSP-POSA3/ERPU	GB41 15	WAW
AGSP-POSA3 (Granite)	GB41 16	WAW
AGSP-POSA3/PHCO2	GB41 17	WAW
AGSP-POSA3/OPPO	GB41 18	WAW
BUNCHGRASS (Shallow-Steep)	GB49 13	OCH,MAL,UMA

SANDBERG BLUEGRASS**(GB90)**

Grasslands dominated by Sandberg bluegrass (POSA3) which occur on shallow, often stony soils. Soils saturated early in growing season, drying by mid summer. Sites commonly provide spring forage for wild ungulates:

AGSP-POSA3 (Shallow-Gentle)	GB49 11	OCH,MAL,UMA,WAW
POSA3-DAUN	GB91 11	OCH,MAL,UMA,WAW
POSA3 SCAB (Pumice)	GB99	WIN,FRE,OCH,DES

ALPINE XERIC GRASSLAND**(GSXX)**

Xeric grasslands dominated by squirreltail (SIHY) or elk sedge (CAGE) which occur at very high elevations in the Blue and Wallowa Mountains:

SIHY	GS50	OCH,MAL,UMA,WAW
CAGE	GS39 11	OCH,MAL,UMA,WAW

SNAKE-WALLOWA GRASS-FORB**(GBFX)**

Xeric grasslands or seasonally wet environments dominated by grasses, sedges and forbs which occur on terraces, rimrocks and sidelopes of deeply incised canyons in Wallowa-Snake province:

SPCR TERRACES	GB12 11	WAW
ERCI	GB71 11	WAW
CACU SEEPS	FW39 11	WAW
LECOW RIMS	FX41 11	WAW
ERUM RIDGE	FM91 13	WAW
ERIOG-PHOR	SD93 22	WAW

MESIC GRASS-FORB**(GMFX)**

Associations occurring on moist, imperfectly-drained to well-drained environments in the Cascade Mountains. Topography often flat to rolling:

CACA	GM41 11	DES,WIN
ELGL	GM41 12	WIN,FRE,OCH
ELGL-BROMU	GM41 21	WIL
XETE-FERU	FM29 11	WIL
VISA-ERPE-ELGL	FM30 11	WIL

SHRUBLANDS

SHRUB SCABLANDS

(SD90)

Associations dominated by low sagebrush (ARAR), rigid sagebrush (ARRI), or buckwheat (ERIOG) often with Sandberg bluegrass (POSA3). Environments are hot and dry. Soils imperfectly-drained early in season due to clay subsoils, often stony in profile and on soil surface. Used by wild ungulates as spring forage:

ARRI/POSA3	SD91 11	OCH,MAL,UMA,WAW
ERDO/POSA3	FM91 11	WAW
ERST2/POSA3	FM91 12	OCH,MAL,UMA,WAW
ERIOG FLATS (Rhyolite)	SD93 23	DES,WIN,FRE
ERIOG SCAB	SD93	WEN,OKA,COL
ARRI/POSA3-LOMA	SD91 31	OCH
ARAR/POSA3-HAST	SD92 11	FRE
ARAR/POSA3-DAUN	SD92 12	FRE,OCH

XERIC SHRUBLANDS

(SDXX)

Associations dominated by sagebrush (ATTR, ARAR), bitterbrush (PUTR), or mountain mahogany (CELE) which are usually well-drained throughout the growing season. Herbaceous layer dominated by bluebunch wheatgrass (AGSP), Idaho fescue (FEID), squirreltail (SIHY) or elk sedge (CAGE). This group provides the bulk of the non-forest rangeland forage for domestic and wild ungulates:

ARAR/AGSP	SD19 11	OCH,MAL,WAW
ARTRV/FEID	SD29 11	OCH,MAL,WAW,UMA
ARTRV-PUTR/FEID	SD29 16	WAW
ARTRV-SYOR/BRCA	SD29 17	WAW
CELE-GRASS	SD40	OCH,MAL,UMA,WAW
CERE2/AGSP	SD56 11	UMA,WAW
GLNE/AGSP	SD65	WAW
RHGL/AGSP	SD61 21	WAW,UMA
ARAR/FEID	SD19 12	DES,WIN,FRE,OCH,MAL
ARTR/FEID-AGSP	SD29 12	DES,WIN,FRE
ARTR/SIHY (Rhyolite)	SD29 14	DES,WIN,FRE
ARTR-PUTR/FEID-AGSP	SD29 13	DES,WIN,FRE,OCH,MAL
PUTR/SIHY-CAREX	SD33 11	DES,WIN,FRE
PUTR/FEID-AGSP	SD31 11	WAW
PUTR/AGSP	SD31 12	WAW
ARTRV/CAGE	SD29 15	WAW
ARAR/FEID-SIHY	SD19 13	FRE

MESIC SHRUBLANDS**(SMXX)**

Associations often occurring within the forest zone or on a topographic position which tends to accumulate subsurface moisture. Shrub layer dominated by snowberry (SYOR, SYAL) or ninebark (PHMA). Stands may have forest potential except for the reoccurrence of natural catastrophes (fires, landslide, snow deposition, frost heave):

SYOR	SM32	WAW
PERA3-SYOR	SD30	WAW
PHMA-SYAL	SM10	OCH,MAL,UMA,WAW
SYAL-ROSA	SM31 11	OCH,MAL,UMA,WAW
RHAL	SM50	DES,WIN,FRE
SHRUB BOTTOMS	SM39 11	DES,WIN,FRE,OCH
RUPA/POPH	SM59 11	WIL
ALSI (ROCK)	SM81 11	WIL
ACCI (ROCK)	SM81 12	WIL
ALIN (SNOW)	SM20	UMA,WAW
ACCI (TALUS)	NTS2 11	WIL
ARTR-ARCA/POCU	SD23 11	OCH,FRE
ALIN	SW29 11	DES,OCH,WIN,FRE
ALIN-SYAL	SW22 11	DES,OCH,WIN,FRE
ALIN-SPDO	SW22 12	DES,OCH,WIN,FRE
ALIN BANK	SW22 14	DES,OCH,WIN,FRE
SALIX/POPR	SW11 11	DES,OCH,WIN,FRE
SAEX	SW11 17	OCH
SALIX/DECA	SW11 19	DES,OCH,WIN,FRE
SPDO	SW41 13	DES,WIN

WET SHRUBLANDS**(SWXX)**

Associations often associated with riparian areas having either standing or running water. Soils often imperfectly-drained through much of the growing season. Shrubs commonly alder (ALIN), willows (SALIX, SAEX, SAEA, SACO2, SABO), huckleberries (VAOC2, VACCI, VAUL), or spirea (SPDO):

ALIN SPRINGS	SW22 13	DES,OCH,WIN,FRE
SALIX/CALA3	SW11 12	DES,OCH,WIN,FRE
SALIX/CAEU	SW11 13	DES,OCH,WIN,FRE
SALIX/CAAQ	SW11 14	DES,OCH,WIN,FRE
SALIX/CASI3	SW11 15	DES,OCH,WIN,FRE
SALIX/CARO2	SW11 16	DES,OCH,WIN,FRE
SALIX/ACCO	SW11 18	DES,OCH,WIN,FRE
SAEA/SACO2 (BOG)	SW11 20	DES,OCH,WIN,FRE
SAEA/SACO2/CASC	SW11 21	DES,OCH,WIN,FRE
SAEA-SABO/CAIN2	SW11 22	DES,OCH,WIN,FRE
CRDO	SW31 11	DES,OCH,WIN,FRE
VAOC2/CASI3	SW41 11	DES,OCH,WIN,FRE
VAOC2/ELPA2	SW41 12	DES,OCH,WIN,FRE
VACCI-SPDE/GRASS	SW41 21	WIL
SPDO-VAUL/CAREX	SW41 22	WIL
SPIRA-SALIX/CAREX	SW41 23	WIL

ALPINE SHRUBLANDS**(SSXX)**

Associations occurring at high elevations in the Cascades, Blue or Wallowa Mountains. Soils either imperfectly-drained early in growing season or well-drained. Stands occur above timberline or subalpine forest savanna:

PHEM	SS19 11	DES,WIN,WAW
POPH	FS59 11	OCH,MAL,UMA,WAW
LINU TALUS	NTS1 11	WAW
ARTRS/CAGE	SS49 11	OCH,MAL,UMA,WAW
ARAR/FERU	SS49 21	FRE,WIN

MEADOWS**GRASS-SEDGE-FORB MEADOWS****(MDMW)**

Associations dominated by grasses, sedges or rushes or forbs without a significant shrub component. Soils are either imperfectly-drained or saturated through most of growing season. Important habitat for wildlife as well as livestock forage, and a component of riparian areas:

PLAYA MEADOWS	FWXX	WAW
DECA (MOIST)	MM19	OCH,MAL,UMA,WAW,WIN,FRE,DES
DECA (WET)	MW10	OCH,MAL,UMA,WAW,WIN,FRE,DES
CAREX (WET)	MW10	WAW,WEN,OKA,COL,OCH,MAL,UMA
POCU	MD19 11	DES,OCH,FRE,WIN
POPR	MD31 11	DES,OCH,FRE,WIN
POPR (RIDGE)	MD31 12	WAW
DECA	MM19 12	DES,OCH,FRE,WIN
DECA-CANE	MM19 11	FRE,WIN
DECA-CAREX (MOIST)	MM19 21	WAW
DECA-CAREX (WET)	MM19 22	WAW
CALA3	MM29 11	DES,OCH,FRE,WIN
CANE	MM29 12	DES,OCH,FRE,WIN
CAEU	MM29 13	DES,OCH,FRE,WIN
CAAQ	MM29 14	DES,OCH,FRE,WIN
CASI2	MM29 15	DES,OCH,FRE,WIN
CALA4	MW29 11	DES,OCH,FRE,WIN
CAREX-CABI	MM39 11	WIL
CAREX-SCIPRUS	MT19 11	WIL
CAIN3	MW19 25	DES,WIN,FRE
JUNE	MW39 11	DES,WIN,FRE
JUBA	MW39 12	DES,WIN,FRE
ELPA2	MW49 11	DES,OCH,FRE,WIN
SCMI (CAAM)	MW19 21	DES,OCH,FRE,WIN
CASI3	MW19 22	DES,OCH,FRE,WIN
CAVE	MW19 23	DES,OCH,FRE,WIN
CARO2	MW19 24	DES,OCH,FRE,WIN
ELPA	MW49 12	DES,OCH,FRE,WIN
CLUN (ALIN)	FW41 11	DES,OCH,FRE,WIN

SETR	FW42 11	DES,OCH,FRE,WIN
VERAT-HELA	FW51 11	WIL
VECA	FW51 21	WIL

SUBALPINE/ALPINE MEADOWS (MSXX)

Associations dominated by sedges and occurring at higher elevations within the Cascade Mountains. Soils are imperfectly-drained early in growing season, often remaining moist well into summer. May be associated with riparian areas or interspersed along the forest savanna:

CABR	MS11 11	DES,WIN
CANI2	MS21 11	DES,WIN
CASC5-CANI2-DECE	MS21 12	DES,WIN
CASC5	MS31 11	DES,WIN

WATER-COVERED AREAS (WX)

Areas occuppied by standing or running water such as estuaries, oceans, streams, lakes and ponds. Floating or submergent vegetation may be present:

WE,WO,WR,WL

NON-VEGETATED AREAS (NX)

Areas that do not have the potential to support at least 10% vegetative cover. Includes avalanche paths, cinder cones, lava fields, mud flows, glacial outwash, flood plains, ice fields, landform failures, mine tailings, talus slopes, and sand dunes:

NA,NC,NF,NI,NM,NR,NS,NT

Forested Vegetation Stratification

WESTERN JUNIPER SERIES

JUNIPER/GRASS

(CJGO)

Hot, well-drained sites occurring on shallow soil. Idaho fescue (FEID), bluebunch wheatgrass (AGSP) are major grasses with open-grown juniper and little or no shrub layer:

JUOC/FEID-AGSP

CJG1 11

WAW,UMA

JUNIPER/SHORT SHRUB

(CJS1)

Hot, dry sites with shallow soils, often with desert pavement on soil surface, imperfectly drained in spring. Major shrubs are less than .5 meters in height and include low sagebrush (ARAR) and rigid sagebrush (ARRI). Sandberg bluegrass (POSA3) and Idaho fescue (FEID) are usually herbaceous dominants. Occurs below 6000 feet elevation. Important early spring and winter forage for wild ungulates:

JUOC/ARAR/FEID

CJS1 12

FRE,OCH,MAL

JUOC/ARRI

CJS8 11

OCH,MAL

JUOC/ARAR

CJS1 11

OCH,MAL

JUNIPER/TALL SHRUB

(CJS2)

Hot, dry sites having soil profiles of moderate depth, few stones, and sandy A1 and AC horizons. Sites have a potential for juniper, big sagebrush (ARTR), green rabbitbrush (CHVI), gray rabbitbrush (CHNA), oceanspray (HODU) and bitterbrush (PUTR). Crested wheatgrass (AGCR) and beardless wheatgrass (AGIN) have been introduced on some sites. Native grasses dominated by Idaho fescue (FEID), bluebunch wheatgrass (AGSP) and Sandberg bluegrass (POSA3):

JUOC/CHNA-ARTR/AGCR

CJS2 91

OCH

JUOC/CHNA-ARTR/AGIN

CJS2 92

OCH

JUOC/ARTR/AGSP-FEID

CJS2 11

OCH

JUOC/ARTR/AGSP (FLAT)

CJS2 26

OCH

JUOC/ARTR-HODU/AGSP-FEID

CJS2 31

OCH

JUOC/ARTR-CHVI/FEID-BASA

CJS2 32

OCH

JUOC/ARTR/AGSP-POSA3

CJS2 13

OCH

JUOC/ARTR/FEID-AGSP

CJS2 12

OCH

JUOC-PIPO/PUTR/FEID

CJC1

OCH,MAL

JUOC/PUTR/BUNCHGRASS

CJS3 11

OCH,MAL,DES,FRE

OREGON WHITE OAK SERIES

OAK/FORB

(HOFO)

Hot, dry sites on the fringe between coniferous forest and valley bottom. Moisture is the most limiting characteristic. Conifers are absent or sparsely present such as ponderosa pine (PIPO) or sugar pine (PILA). Tree reproduction is primarily Oregon white oak (QUGA). Poison oak (RHDI), California hazel (COCOC), common yarrow (ACMI), and western strawberry (FRVEB) are the most frequently found species. Hedgehog dogtail (CYEC) is common. Shrub and herb cover are low; grass cover averages about 50%. Soils are shallow:

QUGA/FRVEB

HOF1

UMP

OAK/SHRUB

(HOSO)

Hot, dry sites where moisture is limiting during most of the growing season. Douglas-fir (PSME) reproduces but has slow growth rates. Poison oak (RHDI), common snowberry (SYAL), and bitterbrush (PUTR) are indicators of hot, dry environments. Soils are shallow to moderate depth:

QUGA/RHDI

HOS1

UMP

QUGA/PUTR

HOS6

WEN,OKA

QUGA/SYAL

HOS3

WEN,OKA

PORT-ORFORD-CEDAR SERIES

PORT-ORFORD-CEDAR/SHRUB

(CTS1)

Warm, moist associations limited to fog-prone stringers inland but more wide spread on the coast. Evapotranspirational demand is low. Port-Orford-cedar (CHLA), white fir (ABCO) and Pacific yew (TABR) are primary understory components. Dwarf Oregongrape (BENE), common prince's-pine (CHUM), baldhip rose (ROGY), red huckleberry (VAPA), western twinflower (LIBOL) and swordfern (POMU) are most common. Stands are often a component of wetlands or riparian areas:

CHLA/BENE/ACTR

CTS1

SIS

CHLA/GASH

CTS2

SIS

CHLA/BENE/LIBOL

CTS1

SIS

CHLA-ACMA

CTH2

SIS

PORT-ORFORD-CEDAR/OAK

(CTH1)

Cool, moist associations limited to moist ultramafic sites with low evapotranspirational demand. Huckleberry oak (QUVA) and western white pine (PIMO) are common with Port-Orford-cedar. Productivity of sites is high for ultramafic soils, generally low for the Port-Orford-cedar series:

CHLA-QUVA

CTH1

SIS

CHLA/GABU

CTS3

SIS

TANOAK SERIES

TANOAK/EVERGREEN HUCKLEBERRY (HTS1)

Warm, moist associations in fog belt of the coastal zone. Tanoak (LIDE3) and Douglas-fir (PSME) are predominant regeneration species. Evergreen huckleberry (VAOV2), dwarf Oregon grape (BENE), salal (GASH) and Pacific rhododendron (RHMA) are common shrubs. Herbaceous cover is low. Swordfern (POMU) is the most common herbaceous plant. Productivity is the highest of the Tanoak Series. Shrubs provide competition for tree establishment:

LIDE3/VAOV2-GASH	HTS1	SIS
LIDE3/VAOV2	HTS1	SIS
LIDE3/RHMA	HTS2	SIS
LIDE3/RHMA-VAOV2	HTS2	SIS
LIDE3-UMCA	HTH2	SIS

TANOAK/RHODODENDRON (HTS2)

Cool, moist associations occurring above the fog belt. Sites are coastal or crest of the Siskiyou Mountains in southwestern Oregon. Tanoak (LIDE3) and Douglas-fir (PSME) dominate the regeneration layer. Sugar pine (PILA) and golden chinquapin (CACH) are common associates in tree layer. Salal (GASH) with dwarf Oregon grape (BENE) and/or Pacific rhododendron (RHMA) are the principal shrubs. Beargrass (XETE) and swordfern (POMU) are common herbs. Productivity relatively high for southwest Oregon. Vegetation management is an important consideration in silvicultural prescriptions:

LIDE3/RHMA-GASH	HTS2	SIS
LIDE3/GASH	HTS3	SIS
LIDE3/GASH-RHMA	HTS3	SIS
LIDE3/GASH-BENE	HTS3	SIS
PSME/RHMA	CDS3	SIS

TANOAK/OREGONGRAPE (HTS3)

Associations in this group occur in cool, dry environments of upper elevations inland from coast and west towards Siskiyou Crest in southwestern Oregon. Associations with white fir (ABCO) occur at mid elevations on cool, mesic environments. Tanoak, Douglas-fir, canyon live oak (QUCH) and golden chinquapin (CACH) are common. Shrub associates are dwarf Oregon grape (BENE), whipplevine (WHMO), prince's pine (CHUM). Common herbs include round-leaved violet (VIOR2) and swordfern (POMU). Biomass production is above average for southwest Oregon, although moisture is the limiting factor later in the growing season:

LIDE3/BENE	HTS3	SIS
LIDE3-ACCI	HTS0	SIS
LIDE3-ABCO-ACCI	HTC4	SIS
LIDE3-ABCO	HTC4	SIS

TANOAK/CANYON LIVE OAK**(HTH1)**

Associations occur in warm, dry environments at mid elevation inland and west towards the Siskiyou Crest in southwest Oregon. Tanoak, Douglas-fir and sugar pine are the primary tree regeneration species. Common shrubs are a mixture of canyon live oak (QUCH), poison oak (RHDI), whipplevine (WHMO), baldhip rose (ROGY) and dwarf Oregongrape (BENE). Swordfern (POMU) and bracken fern (PTAQ) are common herbs. Conifer regeneration establishment is difficult due to late growing season moisture limitations and non-tree vegetation competition:

LIDE3/BENE-RHDI	HTS3	SIS
LIDE3/RHDI-LOHI	HTS4	SIS
LIDE3-QUCH	HTH1	SIS
LIDE3-QUCH/BENE	HTH1	SIS

TANOAK/COFFEEBERRY**(HTS5)**

A tanoak association occurring inland from the coast on ultramafic parent material. California coffeeberry (RHCA), red huckleberry (VAPA) and beargrass (XETE) are common associates:

LIDE3/RHCA	HTS5	SIS
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TANOAK/CONIFER**(HTCO)**

Associations found on sites having high atmospheric moisture and low transpirational demand. Western hemlock (TSHE) and redwood (SESE2) occur near the coast and stands with Port-Orford-cedar (CHLA) occur inland on concavities and microsites having high moisture:

LIDE3-CHLA	HTC3	SIS
LIDE3-SESE2	HTC1	SIS
LIDE3-TSHE	HTC2	SIS

JEFFREY PINE SERIES

Associations contained within this series occur on ultramafic soils and dry, warm environments in southwestern Oregon. Incense-cedar (CADE3) may be codominate. Sites dominated by beargrass (XETE) are dry and cool. Understories dominated by Idaho fescue (FEID), Sandberg bluegrass (POSA3), dwarf ceanothus (CEPU), and hoary manzanita (ARVI) usually indicate dry and hot environments. Sites are often non-commercial for timber production:

JEFFREY PINE/CONIFER	(CPCO)	
PIJE-PSME	CPCO	SIS,UMP
JEFFREY PINE/SHRUB	(CPSO)	
PIJE-QUVA	CPSO	SIS
PIJE/CEPU	CPS1	SIS
JEFFREY PINE/GRASS	(CPGO)	
PIJE/GRASS	CPGO	SIS
PIJE/FEID	CPG1	SIS
JEFFREY PINE/FORB	(CPFO)	
PIJE-PIMO/XETE	CPFO	SIS

PONDEROSA PINE SERIES

PONDEROSA PINE/BUNCHGRASS (CPG1)

Hot sites with well-drained soils. Elevations are less than 5500 feet. Shrubs are often very sparse to absent with herbaceous vegetation such as Idaho fescue (FEID), bluebunch wheatgrass (AGSP), woolly wyethia (WYMO) or arrowleaf balsamroot (BASA). Spring/fall range for wild ungulates. Naturally established tree regeneration difficult to obtain without scarification:

PIPO/AGSP	CPG1 11, CPG1 32	MAL,WAW,UMA
PIPO/FEID	CPG1 12, CPG1 31	OCH,MAL,WAW,UMA
PIPO/WYMO	CPF1 11	FRE
PIPO-PSME/AGSP	CDG3 11	OKA,WEN,COL
PIPO-QUGA/BASA	CPH2 11	MTH

PONDEROSA PINE/SAGEBRUSH (CPS1)

Hot, dry, well-drained sites occurring over a variety of topographic settings. Less than 6000 feet in elevation with mt. mahogany (CELE), big sagebrush (ARTR), and bitterbrush (PUTR) being the major shrubs. Herbaceous indicators include Idaho fescue (FEID), bluebunch wheatgrass (AGSP), bottlebrush squirreltail (SIHY), and Sandberg bluegrass (POSA3). Reforestation may be difficult:

PIPO/ARTR	CPS1	MAL,WAW,OCH
PIPO/PUTR-ARTR/FEID	CPS1 11	WIN,DES,FRE
PIPO/PUTR-ARTR/SIHY	CPS1 12	DES
PIPO-JUOC/CELE-ARTR/FEID	CPC2 11	FRE
PIPO/ARTR/POSA	CPS1 21	FRE

PONDEROSA PINE/BITTERBRUSH/FESCUE (CPS3)

Mesic-tending well-drained sites with moderately deep soils. Topography flat to undulating, occasionally found on cinder cones. Major shrubs are bitterbrush (PUTR), greenleaf manzanita (ARPA), and snowbrush (CEVE). Idaho fescue (FEID) dominates herbaceous layer. Tree productivity moderate, natural regeneration difficult, site scarification required for artificial regeneration. Dwarf mistletoe incidence may be common:

PIPO/PUTR/FEID	CPS2	OCH,MAL
PIPO/PUTR/FEID	CPS2 11	WIN,DES,FRE
PIPO/PUTR-ARPA/FEID	CPS2 17	DES,FRE
PIPO/PUTR-CEVE/FEID	CPS3 14	DES

PONDEROSA PINE/BITTERBRUSH/GRASS (CPS2)

Hot, well-drained sites exhibiting a variety of tall shrubs. Ross' sedge (CARO), Wheeler's bluegrass (PONE), western needlegrass (STOC), and elk sedge (CAGE) represent major herbaceous plants. Elevations generally less than 5500 feet. Natural regeneration of trees usually difficult to obtain:

PIPO/PUTR/CARO	CPS2 21	OCH,MAL
PIPO/PUTR/STOC	CPS2 12	WIN,DES,FRE
PIPO/PUTR-ARPA/STOC	CPS2 13	WIN,DES,FRE
PIPO/PUTR-CEVE/STOC	CPS3 11	WIN,DES,FRE
PIPO/PUTR/SIHY	CPS2 18	DES
PIPO/PUTR/AGSP	CPS2 16	DES,FRE
PIPO/PUTR/CAGE	CPS2	OCH,MAL
PIPO/CELE/PONE	CPS2	MAL,WAW,OCH
PIPO-QUGA/PUTR	CPH2 12	MTH

PONDEROSA PINE/SNOWBERRY**(CPS5)**

Mesic tall shrubs found mainly on upland sites. A variety of shrubs often present on most sites such as snowberry (SYOR, SYAL), oceanspray (HODI), and ninebark (PHMA). Douglas fir often a codominant with ponderosa pine. Pinegrass (CARU) and elk sedge (CAGE) as common herbs:

PIPO-PSME/PHMA	CDS7 11	WAW,UMA,MAL
PIPO/SYOR	CPS5	MAL,WAW
PIPO-PSME/SYAL	CDS6 11	OCH,MAL,WAW,UMA
PIPO-PSME/HODI	CDS6	MAL,WAW,UMA
PIPO/SYAL	CPS5	WEN
PIPO/SYAL-WALLO	CPS5 22	WAW
PIPO/SYAL (Flood)	CPS5 11	DES,WIN,FRE,OCH
PIPO/SPDO-SYAL	CPS5 12	DES,WIN,FRE
PIPO/SPBE	CPS5 23	WAW

PONDEROSA PINE/SODGRASS**(CPG2)**

Warm to hot, moist to dry-tending sites with well-drained soils by mid summer. Associations occur over a variety of topography as flat to in excess of 40% slopes. Rhizomatous grasses and/or sedges predominate as elk sedge (CAGE), long-stolon sedge (CAPE), Kentucky bluegrass (POPR), or blue wildrye (ELGL). Stands may be dominated by shrubs as bitterbrush (PUTR), or snowbrush (CEVE):

PIPO/ELGL	CPM1 11	OCH,MAL,WAW
PIPO/CAGE	CPG2	OCH,MAL,WAW,UMA
PIPO/CARU (Residual)	CPG2	OCH,MAL,WAW,UMA
PIPO/CARU (Ash)	CPG2	OCH,MAL,WAW,UMA
PIPO/PUTR-CEVE/CAPE	CPS3 12	DES,WIN
PIPO/PUTR/CAPE	CPS2 15	DES,WIN
PIPO/PUTR-ARPA/CAPE	CPS2 14	WIN
PIPO/CAPE-FEID-LALA	CPG2 12	DES
PIPO-POTR/POPR	CPH3 11	FRE

DOUGLAS-FIR SERIES

DOUGLAS-FIR/SODGRASS

(CDG1)

Douglas-fir (PSME) as the climax potential with rhizomatous grasses or sedges dominating the herb layer. Shrubs are uncommon or of low stature and definitely subordinate to the herbaceous layer. Pinegrass (CARU), elk sedge (CAGE) or western fescue (FEOC) dominate herb layer. Soils are well-drained:

PSME/CARU	CDG1 31	OKA,COL,WEN
PSME/VACI	CDS811	OKA
PSME/VACA	CDS8 13	COL
PSME/CAGE (Blues)	CDG1 11	OCH,MAL,UMA,WAW
PSME/CARU (Ash)	CDG1	OCH,MAL,UMA,WAW
PSME/CARU (Residual)	CDG1	OCH,MAL,UMA,WAW
PSME/CARU	CDG1 21	WAW
PSME/CAGE	CDG1 41	MTH
PSME/FEOC	CDG3 21	MTH

DOUGLAS-FIR/TALL SHRUB

CDS7

Douglas-fir climax potential with a tall shrub (>.5 meters tall) layer. Typically found on relatively hot to warm and dry sites. Common associated trees include ponderosa pine (PIPO), lodgepole pine (PICO) and western larch (LAOC). Medium to tall shrubs dominate the undergrowth and typical species are ninebark (PHMA), mountain snowberry (SYOR), oceanspray (HODI), bitterbrush (PUTR), pachistima (PAMY), big huckleberry (VAME) and Douglas-maple (ACGL):

PSME/SYOR	CDS6 32	OKA,COL,WEN
PSME/SYOR (Wallowa)	CDS6 23	WAW
PSME/ARUV-PUTR	CDS6 31	OKA,WEN
PSME/PAMY	CDS4 11	OKA
PSME/PHMA	CDS7 15	OKA,COL
PSME/PHMA (Blues)	CDS7 11	OCH,MAL,UMA,WAW
PSME/PHMA/LIBO2	CDS7 16	COL
PSME/ACGL/PHMA	CDS7 22	WAW
PSME/VAME	CDS8 14	COL
PSME/HODI/CAGE	CDS2 31	MTH
PSME/VAME	CDS8 12	WAW

DOUGLAS-FIR/LOW SHRUB**(CDS6)**

Douglas-fir climax potential with a low shrub (<.5 meters tall) layer found on relatively warm sites. Common associated trees may include ponderosa pine (PIPO), lodgepole pine (PICO) and western larch (LAOC). Stands in the Blue Mountains may contain grand fir (ABGR). Low to medium shrubs such as common snowberry (SYAL), bearberry (ARUV) and shiny-leaf spirea (SPBE) dominate the undergrowth:

PSME/ARUV (ARNE)	CDG1 23	OKA,WEN,COL
PSME/SYAL	CDS6 33	OKA,COL,WEN
PSME/SYAL (MtHood)	CDS6 61	MTH
PSME/SYAL (Wallowa)	CDS6 22	WAW,OCH,MAL,UMA
PSME/SPBE	CDS6 34	WAW
PSME-ABCO/SYAL/LIBO	CDS6 12	DES
PSME-ABCO/SYAL/FORB	CDS6 13	DES
PSME-ABCO/SYAL/CARU	CDS6 14	DES

DOUGLAS-FIR/SHRUB, DRY**(CDS2)**

Hot, dry Douglas-fir associations. Douglas-fir (PSME) and ponderosa pine (PIPO) are the primary regenerating conifer species. Incense-cedar (CADE3) and sugar pine (PILA) are not uncommon. Jeffrey pine (PIJE) will be dominant on the ultrabasic parent materials. Oregongrape (creeping) (BERE), Piper's (BEPI), and dwarf (BENE)), salal (GASH), ocean-spray (HODI), whipple vine (WHMO), and poison oak (RHDI) are common. Tree productivity is low. Moisture stress occurs early in the long growing season. These associations are commonly found at lower elevations, often at the transition between the coniferous and hardwood forests:

PSME/HODI/Grass	CDS2 12	WIL
PSME/HODI-WHMO	CDS2 13	WIL
PSME/BERE	CDS5	ROR-S
PSME/RHDI-BEPI	CDS1	SIS,ROR-S
PSME/RHDI	CDS1	SIS,ROR-S
PSME/Depauperate	CDF0	SIS,ROR-S
PSME-PIJE	CDC5	SIS,ROR-S,UMP
PSME-PIPO	CDC5	ROR-S
PSME/RHDI/CYGR	CDS1	ROR-C,UMP
PSME/RHDI/PTAQ	CDS1	UMP
PSME/ACCI/FEOC	CDS2 41	GIP

DOUGLAS-FIR/INFERTILE**(CDC3)**

Douglas-fir (PSME) and incense-cedar (CADE3) generally dominate the canopy, often with sugar pine (PILA) and other dry site species. Incense-cedar and/or Douglas-fir regenerate in most stands. Rhododendron (RHMA) and other evergreen shrubs form a dense understory. Herbaceous species are present but not abundant. Soils are generally stony, shallow, excessively well-drained and low in nitrogen. Reforestation can be difficult due to shrub competition, drought and heat. Tree growth is moderate to slow once trees are established:

PSME-TSHE/RHMA	CDC7 12	WIL
PSME-CADE3-PILA	CDC3	UMP

DOUGLAS-FIR/TANOAK**(CDH1)**

Coastal rainshadow, inland types with tanoak (LIDE3) abundantly associated with Douglas-fir regeneration. Canyon live oak (QUCH) and Pacific madrone (ARME) co-occur in understory. Baldhip rose (ROGY), dwarf Oregongrape (BENE), and California hazel (COCOC) are common shrubs; swordfern (POMU) and bracken (PTAQ) are common herbs. Environment is warm and dry. Tanoak and canyon live oak make vegetation management an important consideration:

PSME-LIDE3/GASH	CDH1	SIS
PSME-LIDE3-PILA	CDH1	SIS
PSME-LIDE3/RHDI	CDH1	SIS
PSME-LIDE3	CDH1	SIS
LIDE3-QUCH	CDH5	SIS

DOUGLAS-FIR/WHITE FIR**(CDC4)**

Cool, dry associations on south aspects of high elevation inland Siskiyou. White fir (ABCO) is common and abundant associate with Douglas-fir (PSME). Creambush oceanspray (HODI) and baldhip rose (ROGY) dominate shrubs. Productivity is high for Douglas-fir Series. Vegetation management is not as necessary here as in other groups. Moisture is often limiting in mid to late growing season:

PSME-ABCO-PIJE	CDC4	SIS,ROR-S
PSME-ABCO	CDC4	SIS,ROR-S
PSME-ABCO-PIPO	CDC4	SIS,ROR-S
PSME-ABCO/HODI	CDC4	SIS,ROR-S
PSME-ABCO/BENE	CDC4	SIS,ROR-S

DOUGLAS-FIR/EVERGREEN SHRUB**(CDS5)**

Douglas-fir (PSME), incense-cedar (CADE3), sugar pine (PILA), and occasionally ponderosa pine (PIPO) form the overstory. Stands in the Olympic Peninsula dominated by Douglas-fir with some grand fir (ABGR). Understories consist of oceanspray (HODI), poison oak (RHDI) and other dry site-indicating species with dwarf Oregongrape (BENE), and salal (GASH). Soils are either steep and rocky, shallow or deep clay. Summer drought is pronounced. Tree growth is slow to moderate. Reforestation can be difficult due to heat and drought. Wildlife use for winter range is often high:

PSME/HODI-ROGY	CDS2 21	OLY
PSME/HODI-BENE	CDS2 11	WIL
PSME/SYMO	CDS6 41	WIL
PSME/GASH	CDS2 55	OLY
PSME/BENE/POMU	CDS5	UMP
PSME/GASH/POMU	CDS5	UMP

DOUGLAS-FIR/BEARBERRY**(CDSO)**

Associations having Douglas-fir (PSME) climax potential and very open, sparse tree canopies. Hot, dry south aspects predominate with very shallow and rocky soils. The understory is dominated by bearberry (ARUV) or pinemat manzanita (ARNE), but is otherwise sparse. Timber productivity and stocking levels are very low. Regeneration following even-age harvest regimes is extremely difficult:

PSME/ARUV	CDS6 51	OLY
PSME/ARNE	CDS6 62	MTH

GRAND FIR-WHITE FIR SERIES

WHITE FIR/SODGRASS

(CWG1)

Associations with grand or white fir climax potential that have ground vegetation dominated by rhizomatous grasses or sedges such as elk sedge (CAGE), long-stolon sedge (CAPE), or pinegrass (CARU). Associated trees may be Douglas-fir (PSME), ponderosa pine (PIPO), lodgepole pine (PICO):

ABGR/CAGE	CWG1 21	WEN,MTH
ABGR/CAGE (GIP)	CWG1 22	GIP
ABGR/CARU	CWG1 23	GIP
ABGR/CARU (Residual)	CWG1 11	OCH,MAL,UMA,WAW
ABGR/CARU (Ash)	CWG1 12	OCH,MAL,UMA,WAW
ABCO-PICO/CAPE-STOC	CWC3 11	FRE
ABCO-POTR-PIPO/CAPE	CWH2 11	FRE

WHITE FIR/TALL SHRUB, MESIC

(CWS5)

Associations where grand or white fir are potential climax and which have a shrub layer exceeding 0.5 meters in height. Environments are warm to hot and frost or low temperatures are not limiting. Common shrubs are oceanspray (HODI), bigleaf maple (ACCI), Pacific dogwood (CONU), golden chinkquapin (CACH), snowbrush (CEVE) or ninebark (PHMA). Herbs are represented by vanillaleaf (ACTR), bracken fern (PTAQ), pinegrass (CARU) or western needlegrass (STOC):

ABGR/ACCI-BEAQ/TRLA2	CWS5 35	GIP
ABGR/ACCI/ACTR	CWS5 32	MTH
ABGR/COCO2/ACTR	CWS5 36	GIP
ABGR/HODI	CWS5 31	MTH
ABGR/HODI(GP)	CWS5 34	GIP
ABGR/CONU/ACTR	CWS5 37	GIP
ABGR/CACH	CWS5 33	MTH
ABGR/ACGL	CWS9 12	WAW
ABGR/ACGL-PHMA	CWS4 12	WAW
ABGR/ACCI	CWS5	WEN
ABGR/PHMA	CWS7 22	COL
ABCO-PIPO-PILA/ARPA	CWC4 12	FRE
ABCO/CACH-PAMY/CHUM	CWH1 12	WIN
ABCO-PSME/CEVE-CACH/PTAQ	CWC2 11	FRE
ABCO-PSME/CEVE-CACH/CARU	CWC2 12	FRE
ABCO/CEVE/CAPE-PTAQ	CWC2 13	FRE
ABCO-PSME/CEVE/PTAQ	CWC2 15	FRE
ABCO/CEVE-CACH/STOC	CWH1 11	DES,FRE,WIN
ABCO-PIPO/CEVE-ARPA	CWS1 12	DES,FRE,WIN

WHITE FIR/TALL SHRUB, COOL**(CWSC)**

Associations where grand or white fir are potential climax and which have a shrub layer exceeding 0.5 meters in height. Environments are cool and frost or low temperatures may be limiting. Common shrubs are big huckleberry (VAME), snowbrush (CEVE), greenleaf manzanita (ARPA), and western thimbleberry (RUPA). Herbs are characterized by fairybells (DIHO), twinflower (LIBO2), queencup beadlily (CLUN), strawberry (FRVI) or long-stolon sedge (CAPE):

ABGR/VAME	CWS2 11	OCH,MAL,UMA,WAW
ABGR-PIEN/VAME	CWC5	OCH,MAL,UMA,WAW
ABGR/RUPA/DIHO	CWS2 23	GIP
ABGR/VAME/LIBO2	CWS2 21	GIP
ABGR/VAME/CLUN	CWS2 22	GIP
ABGR/TABR/CLUN	CWF4 22	WAW
ABCO-PIPO/ARPA-BERE	CWS1 17	FRE
ABCO-PIPO-PIMO/RIVI	CWC4 11	FRE
ABCO/CEVE-CEPR/FRVI	CWS1 16	WIN
ABCO/ALIN (Meadow)	CWM1 11	WIN
ABCO-PIPO-LIDE/AMAL	CWC1 11	FRE
ABCO/CEVE-ARUV	CWC2 15	WIN
ABGR/TABR	CWC8	OCH,MAL,WAW
ABCO/CEVE-ARPA/CAPE-PEEU	CWS1 13	DES,WIN
ABCO/CEVE (Pumice)	CWS1 14	DES,FRE,WIN
ABCO/CEVE/CAPE (Pumice)	CWS1 15	DES,WIN

WHITE FIR/LOW SHRUB, MESIC**(CWS3)**

Grand or white fir occurs as climax potential with a shrub layer generally less than 0.5 meters in height. Environments are warm to hot and frost or low temperatures are not limiting. Common shrubs are pinemat manzanita (ARNE), bearberry (ARUV), spirea (SPBE), dwarf Oregongrape (BENE):

ABGR/BENE/ACTR	CWS2 24	GIP
ABGR/SYMPH	CWS3 31	MTH
ABGR/SYMO/ACTR	CWS3 32	GIP
ABGR/SPBE	CWS3 21	WAW
ABGR/ARNE	CWS6	WEN
ABCO/ARUV	CWS5 21	WIL

WHITE FIR/LOW SHRUB, COOL**(CWS8)**

Grand or white fir occurs as climax potential with a shrub layer generally less than 0.5 meters in height. Environments are cool and frost or low temperatures may be limiting. Common shrubs are princespine (CHUM), grouse huckleberry (VASC), dwarf Oregongrape (BENE), snowberry (SYAL):

ABGR/CHUM	CWF2 11	WIL
ABGR/VASC	CWS8 11	OCH,MAL,UMA
ABGR/BENE	CWS5	WEN
ABGR/VACA	CWS8 21	COL
ABCO/SYAL/FRVI	CWS3 12	WIN
ABCO-PIPO/SYAL/STJA	CWS3 13	FRE

WHITE FIR/FORB, MESIC**(CWFM)**

Grand or white fir occurs as climax potential with a shrub layer generally lacking and forb layer dominant. Environments are warm to hot with frost or low temperatures not limiting. Common herbs are twinflower (LIBO2) or western starflower (TRLA2):

ABGR/LIBO2	CWF3 11	OCH,MAL,UMA,WAW
ABGR/FORB	CWF3	OCH,MAL,UMA,WAW
ABGR/TRLA2	CWF5 21	MTH
ABGR/LIBO2	CWF3 21	MTH
ABGR/ACTR	CWF5 22	MTH

WHITE FIR/FORB, COOL**(CWFC)**

Grand or white fir occurs as climax potential with a shrub layer generally lacking and forb layer dominant. Environments are warm to hot with frost or low temperatures usually not limiting. Common herbs are queencup beadleily (CLUN), starry solomonplume (SMST), miterwort (MIST2) or goldthread (COCO2):

ABGR-PIEN/MIST2	CWC5	OCH,MAL,UMA,WAW
ABAM-ABGR/SMST	CFC3 11	WIL
ABGR-PIEN/SMST	CWC5 11	MTH
ABGR/POPU	CWF5 23	MTH
ABGR/CLUN (WAW)	CWF4 21	WAW
ABGR/CLUN	CWF4 11	COL
ABCO/CLUN	CWF4 31	DES,WIN,FRE
ABGR/COCO2	CWF5 11	WAW
ABCO-ABAM/BENE	CWC7	UMQ

WHITE FIR/SW ORE, COOL-MESIC**(CWH4)**

Associations occur mostly within the Cascades province on andesites and basalts at mid to high elevations. Productive sites except where Douglas maple (ACGL) indicate rocky, wet sites. Douglas-fir dominates most stands because recent disturbance has perpetuated mid-seral stages. Vanillaleaf (ACTR) or dwarf Oregongrape (BENE) usually common ground vegetation:

ABCO/RUNI/ACTR	CWS6	UMP,ROR-C
ABCO/VAME/ACTR	CWS2	UMP,ROR-C
ABCO-ACGL/BENE	CWH4	UMP,ROR-C
ABCO-ACGL	CWH4	SIS,ROR-S

WHITE FIR-BREWER SPRUCE**(CWC5)**

Associations occur only in Siskiyou mountains on cool to cold sites with shallow soils but low evaporative demand. These sites are of low tree productivity. Brewer spruce (PIBR) associated with white fir:

ABCO-PIBR/VAME	CWC5	SIS,ROR-S
ABCO-PIBR/GAOV	CWC5	SIS,ROR-S
ABCO-PIBR/CHUM	CWC5	SIS,ROR-S

WHITE FIR/SW ORE, MESIC**(CWSM)**

Associations occurring in Siskiyou Mountains and Cascades on mesic sites at mid elevations. They are of average productivity. Threelobed anemone (ANDE), western twinflower (LIBOL), or dwarf Oregongrape (BENE) are common:

ABCO/BENE-GASH	CWS2	UMP,ROR-C
ABCO/BENE/ANDE	CWS5	UMP,ROR-C
ABCO/AMAL/ANDE	CWS7	UMP,ROR-C
ABCO/COCOC-AMAL	CWS5	ROR-C
ABCO/CHUM/LIBOL	CWS2	UMP,ROR-C
ABCO/CHUM/PYROLA	CWS2	UMP,ROR-C
ABCO/HERB	CWF0	SIS,ROR-S
ABCO-PICO	CWC3	ROR-C

WHITE FIR/SW ORE, COASTAL**(CWC6)**

Associations occur on coastal Siskiyou Mountains at mid to low elevations and in concavities with low evaporative demand. Sites are productive and have deep soils. Port-Orford-cedar (CHLA), tanoak (LIDE3), vine maple (ACCI) often common:

ABCO-CHLA	CWC6	SIS
ABCO-CHLA/Depauperate	CWC6	SIS
ABCO-LIDE3	CWH3	SIS
ABCO/BENE	CWS5	SIS,ROR-S
ABCO-TABR	CWS8	SIS,ROR-S
ABCO-ACCI/ACTR	CWS5	UMP,ROR-C
ABCO-TSHE-ACCI	CWC9	UMP,ROR-C

WHITE FIR/SW ORE, WARM-XERIC**(CWC2)**

Associations represent a dry white fir group of moderate productivity and with various soil depths. Moisture is consistently the most limiting factor for survival and growth. These associations occur mostly in the Siskiyou Mountains and occasionally in the Cascades. Dwarf Oregongrape (BENE), oceanspray (HODI), or Piper's Oregongrape (BEPI) common:

ABGR/BENE	CWS5 22	WIL
ABCO-PSME	CWC2	SIS,ROR-S
ABCO-PSME/Depauperate	CWC2	SIS,ROR-S
ABCO-PSME/HODI	CWC2	SIS,ROR-S
ABCO-PSME/BENE	CWC2	SIS,ROR-S
ABCO-CADE3/BENE	CWC1	UMP,ROR-C
ABCO-PSME/BEPI	CWC2	UMP,ROR-C

WHITE FIR/SW ORE, HOT-XERIC**(CWS6)**

Associations that occur on hot, dry environments at lower elevations or on ridgetops and shallow soils at mid elevations. Stands generally indicate potential low volume production. Creeping snowberry (SYMO) or poison oak (RHDI) are diagnostic indicators:

ABCO-PIPO	CWC2	SIS,ROR-S
ABCO/SYMO	CWS3	SIS,ROR-S
ABCO/RHDI	CWS9	UMP,ROR-C

LODGEPOLE PINE SERIES

LODGEPOLE PINE/GRASS, XERIC (CLG4)

Climax lodgepole pine (PICO) on xeric pumice soils of Mt. Mazama origin. Topography is undulating to flat. Shrub layer usually absent, ground vegetation dominated by grasses, sedges, and/or forbs. Cold air ponding and frost heaving possible any night during growing season. Artificial regeneration difficult to achieve with any species other than lodgepole pine. Pocket gophers common in stands dominated by long-stolon sedge (CAPE) or lupine (LULA). This strata includes the most productive and the least productive of the climax lodgepole pine associations:

PICO/STOC (Basins)	CLG3 11	DES,WIN,FRE
PICO/STOC-CAPE (Basins)	CLG4 13	DES,WIN
PICO/CAPE-LULA	CLG4 11	DES,WIN
PICO/CAPE-LULA-PEEU	CLG4 12	DES
PICO-SIHY-CAPE	CLG4 13	FRE
PICO/STOC-LUCA	CLG3 14	WIN,FRE
PICO/XETE	CLM4 11	DES,WIN

LODGEPOLE PINE-WHITEBARK PINE (CLCO)

Climax lodgepole pine (PICO) associations occurring above 6400 feet elevation on the Fremont NF. Shrub layer usually absent. Ground vegetation dominated by Wheeler bluegrass (POWH), and long-stolon sedge (CAPE), or forbs as King's sandwort (ARKI) and gay penstemon (PELA). Regeneration is difficult to establish. Tree productivity is potentially low:

PICO-PIAL/PELA	CLC1 11	FRE
PICO-PIAL-PIMO/ARKI	CLC1 12	FRE

LODGEPOLE PINE/WETLAND (CLM1)

Climax lodgepole pine (PICO) associations occurring on mesic pumice environments or volcanic ash soils. Topography is usually flat to concave. Ground vegetation dominated by shrubs, grasses or sedges which tolerate high water tables or seasonal ponding. The lower to bottom slope positions accumulate cold air. Tree productivity can be some of highest for climax lodgepole pine sites. Seasonal high water tables provide a constraint on operability of machinery. Associations often are components of riparian areas and have high value as wildlife habitat for wild ungulates, raptors and upland game birds:

PICO/SEDGE (Wetland)	CLM1 11	DES,WIN,FRE
PICO/FORB	CLF1 11	WIN
PICO-POTR/FRVI	CLH1 11	FRE
PICO/CARZ (Wetland)	CLM1	OCH,MAL,UMA
PICO/POPR	CLM1 12	DES,FRE,WIN,OCH
PICO/CAEU	CLM1 13	DES,FRE,WIN
PICO/CAAQ	CLM1 14	FRE,OCH
PICO/DECA	CLM1 15	DES,FRE,WIN
PICO/VAOC2/CAEU	CLM3 12	DES,FRE,WIN
PICO/SPDO/FORB	CLM3 13	DES,FRE,WIN
PICO/SPDO/CAEU	CLM3 14	DES,FRE,WIN
PICO-PIEN/ELPA2	CLM9 11	DES,WIN,FRE,OCH

LOGGEPOLE PINE/SHRUB, WARM-XERIC (CLS2)

Climax lodgepole pine (PICO) associations occurring at low to mid elevations within the pumice deposition zone of Mt. Mazama. Soils are well-drained. Topography is flat to undulating basins and plateaus. Stands characterized by a shrub layer composed of bitterbrush (PUTR) or big sagebrush (ARTR). Herbaceous layer dominated by Idaho fescue (FEID), western needlegrass (STOC), or long-stolon sedge (CAPE). Cold air ponding and frost heaving can occur any nite during the growing season. Mid-day growing temperatures warm to hot. Regeneration is most often restricted to lodgepole pine. Site scarification may be necessary to reduce fescue or sedge competition. Tree productivity ranges from low to moderate:

PICO/ARTR (Rhyolite)	CLS1 12	DES
PICO/PUTR (Rhyolite)	CLS2 16	DES
PICO/ARTR/FEID	CLS1 11	DES
PICO/PUTR/FEID	CLS2 14	DES,FRE,WIN
PICO/FRVI-FEID	CLG3 15	FRE
PICO/PUTR/STOC	CLS2 11	DES,FRE,WIN
PICO/RICE-PUTR/STOC	CLS2 15	DES,WIN
PICO/PUTR/CAPE	CLS2 12	DES,WIN

LOGGEPOLE PINE/SHRUB, COOL-XERIC (CLS4)

Climax lodgepole pine (PICO) associations occurring at upper elevations within south-central Oregon and Blue Mts. Soils well-drained. Topography is undulating to steep, plateaus and mountain slopes. Stands characterized by a shrub layer composed of linanthastrum (LINU), pinemat manzanita (ARNE) or grouse huckleberry (VASC). Herbaceous layer dominated by pinegrass (CARU), western needlegrass (STOC), or long-stolon sedge (CAPE). Cold air ponding and frost heaving can occur any nite during the growing season. Mid-day growing temperatures cool to warm. Regeneration is restricted to lodgepole pine, artifical establishment difficult. Tree productivity ranges from low to moderate:

PICO/STOC-LUCA-LINU	CLG3 13	DES
PICO/VASC	CLS4 12	DES,WIN,FRE
PICO/VASC/CAPE	CLS4 14	WIN
PICO/CARU-VASC	CLG2 11	OCH,MAL,UMA,WAW
PICO/ARNE	CLS3 11	DES,WIN,UMQ

LOGGEPOLE PINE/SHRUB, MOIST (CLSM)

Climax lodgepole pine (PICO) occurring on seasonally high water tables within south-central Oregon pumice deposition zone. Topography is gentle, undulating to flat. Shrub layer is characterized by bearberry (ARUV), bitterbrush (PUTR), or huckleberrys (VACA,VACZ). Herbaceous layer has mesic-tending grasses and forbs, with wetland sedges on huckleberry sites. Pocket gophers usually common on bearberry and bitterbrush sites. Natural regeneration is not difficult to establish under a shelterwood. Stands are important as wildlife habitat for wild ungulates, raptors, and gamebirds:

PICO/ARUV	CLM2 11	DES,WIN,FRE
PICO/PUTR/Forb	CLS2 13	DES,WIN,FRE
PICO/VACA (Wetland)	CLM3 11	DES,WIN,FRE
PICO/VACA/Forb	CLS4 13	WIN

SITKA SPRUCE SERIES

SITKA SPRUCE/SHRUB (CSS5)

Sitka spruce (PISI) and western hemlock (TSHE) dominate, occasionally with Douglas-fir (PSME) in the canopy. Salmonberry (RUSP), devil's club (OPOH), and/or salal (GASH) dominate a shrub layer, often with abundant herbaceous species. Cool, moist sites near the ocean with moderately deep to deep soils. Rainfall abundant, snow uncommon. Soils may be poorly drained, especially if devil's club is abundant. Reforestation can be difficult due to shrub competition. Tree growth is potentially good to excellent. Associations often occur as a component of riparian areas:

PISI/GASH	CSS3 21	SIU
PISI/RUSP	CSS5 21	SIU
PISI/RUSP-GASH	CSS5 22	SIU
PISI/OPHO	CSS6 21	SIU

SITKA SPRUCE/SWORDFERN (CSF1)

Sitka spruce (PISI) and western hemlock (TSHE) dominate, occasionally with Douglas-fir (PSME) in the canopy. Understory is herb rich usually without a dense shrub layer. Swordfern (POMU) and oxalis (OXOR) are common in the herb layer. Cool, moist sites near the ocean with deep, rich soils. Rainfall abundant, snow uncommon. Reforestation generally easy to point where overstocking may be common. Tree growth is good to excellent. Associations often are a component of riparian areas:

PISI/POMU-OXOR	CSF1 11	OLY
PISI/POMU	CSF1 21	SIU
PISI/OXOR	CSF3 21	SIU
PISI/MEFE-VAPA	CSS2 21	SIU

WESTERN REDCEDAR SERIES

REDCEDAR/FORB (CCF2)

Western red cedar (THPL) is the climax dominant. Douglas-fir (PSME), western larch (LAOC), grand fir (ABGR) and lodgepole pine (PICO) may be locally common. Mid-successional stages often are dominated by grand fir (ABGR) and Douglas-fir (PSME). Seral shrubs are common, especially after burning and may hinder reforestation. Tree growth, once established, is moderate to good. Associations occur on well drained soils on upland sites and on lower slope positions:

THPL/CLUN	CCF2 21	COL
THPL/ARNU3	CCF2 22	COL
THPL/VAME	CCS3 11	COL
THPL-ABGR/ACTR	CCF2 11	MTH
THPL/ACTR	CCF2 12	GIP

REDCEDAR/DEVIL'S CLUB**(CCS2)**

Western redcedar (THPL) or western hemlock (TSHE) are climax potential. Grand fir (ABGR) may dominate mid-successional stands with better moisture drainage. Other associated conifers may include Douglas-fir (PSME) and Engelmann spruce (PIEN). Ladyfern (ATFI), or other ferns may be abundant under the shrub layer of devil's club (OPHO). Associations occur on wet, swampy sites in bottoms or on a perched water table. Sites are very wet, often with standing water. Reforestation is often difficult to achieve due to seasonally high water tables. Tree growth is moderate:

THPL/OPHO	CCS2 11	COL,OKA
THPL-ABGR/OPHO	CCS2 21	GIP

WESTERN HEMLOCK SERIES**WESTERN HEMLOCK/RHODODENDRON-SALAL (CHS3)**

Western hemlock (TSHE) and Douglas-fir (PSME) occur as major tree species. Western redcedar (THPL) and other conifers may be codominants or subordinates. Pacific rhododendron (RHMA), dwarf Oregon grape (BENE), salal (GASH) and other evergreen shrubs are common. Ground vegetation is generally herb-poor; beargrass (XETE) is not common. Warm to cool sites without persistent snowpack. Soils generally stony and nutrient poor. Reforestation is not difficult to achieve, and tree growth, once established, is moderate:

TSHE/RHMA-BENE	CHS3 21	SIU
TSHE/RHMA-GASH	CHS3 22	SIU
TSHE/RHMA-VAOV2	CHS3 24	SIU
TSHE/RHMA-GASH	CHS3 27	MTH
TSHE/RHMA-BENE	CHS3 28	MTH
TSHE/RHMA-GASH	CHS3 51	WIL
TSHE/RHMA-BENE	CHS3 52	WIL
TSHE/RHMA/LIBO2	CHS3 55	WIL
THPL-TSHE/WHMO	CCC2	UMP
THPL-TSHE/RHMA	CCC2	UMP
TSHE-ABCO	CHC3	SIS
TSHE-CADE3/GASH	CHC6	UMP
TSHE-CADE3/RHMA/CLUN	CHC6	UMP
TSHE-TABR/RHMA	CHC9	UMP,ROR-C
TSHE-THPL/RHMA	CHC4	UMP
TSHE-THPL-PSME	CHC4	UMP
TSHE-THPL (high elev)	CHC4	SIS
TSHE/GASH	CHS1	SIS
TSHE/RHMA	CHS3	SIS
TSHE/RHMA/LIBOL	CHS3	UMP,ROR-C
TSHE-QUSA	CHH5	SIS
TSHE-CACH-RHMA	CHH3	UMP

WESTERN HEMLOCK/SHRUB, MOIST (CHS4)

Western hemlock (TSHE) and Douglas-fir (PSME), often with western redcedar (THPL) are in the tree canopy. Salmonberry (RUSP) and devil's club (OPHO) are common. Skunkcabbage (LYAM), oxalis (OXOR) and swordfern (POMU) may be present. Warm to cool, moist to wet sites with poorly-drained soils or abundant moisture, often a component of riparian areas. Snowpacks are temporary. Reforestation may be difficult due to competition from shrubs. Tree growth is moderate to excellent once trees become established:

TSHE/ATFI	CHF4 21	GIP
TSHE/LYAM	CHM1 21	MTH,GIP
TSHE/LYAM (OLY)	CHM1 11	MBS,OLY
TSHE/RUSP	CHS4 21	SIU
TSHE/RUSP-ACCI	CHS4 22	SIU
TSHE/RUSP-GASH	CHS4 23	SIU
TSHE/RUPE	CHS4 11	COL
TSHE/OPHO	CHS5 11	WIL
TSHE/OPHO	CHS5 12	OLY,MBS
TSHE/OPHO	CHS5 21	SIU
TSHE/OPHO/OXOR	CHS5 22	MTH
TSHE/OPHO/SMST	CHS5 23	MTH
TSHE/OPHO/POMU	CHS5 24	GIP
TSHE/VAAL-OPHO	CHS6 11	MTH
TSHE-ACCI/ALRU	CHS2	ROR-C,UMP

WESTERN HEMLOCK/SALAL-OREGONGRAPE (CHS1)

Western hemlock (TSHE) and Douglas-fir (PSME), often with western redcedar (THPL) are in tree canopy. Dwarf Oregongrape (BENE) and/or salal (GASH) with swordfern (POMU) common in understory. Alaska huckleberry (VAAL) common on some sites. Relatively warm sites with well-drained, but not excessively dry, soils. Reforestation is not difficult to establish; potential tree growth moderate:

TSHE/LIBO2	CHF3 21	WIL
TSHE/GASH	CHS1 11	WIL
TSHE/BENE	CHS1 21	SIU
TSHE/BENE-GASH	CHS1 22	SIU
TSHE/GASH	CHS1 23	SIU
TSHE/BENE-GASH	CHS1 24	WIL
TSHE/BENE	CHS1 25	WIL,GIP,MTH
TSHE/BENE/POMU	CHS1 26	MTH,GIP
TSHE/GASH/POMU	CHS1 37	OLY,MBS
TSHE/BENE/POMU	CHS1 39	OLY,MBS
TSHE/ACCI-GASH	CHS2 21	SIU
TSHE/RHMA/POMU	CHS3 23	SIU
TSHE/VAOV2	CHS6 10	SIU
TSHE/VAAL-GASH	CHS6 14	MTH
TSHE/VAAL-GASH	CHS6 14	GIP
TSHE/VAAL	CHS6 21	OLY
TSHE/VAAL-GASH	CHS6 24	OLY,MBS
TSHE-THPL/BENE	CHC4	UMP
TSHE-THPL-CONU	CHC4	UMP
TSHE-THPL/RUNI	CHC4	UMP
TSHE/GASH/HIAL	CHS1	UMP
TSHE/GASH/LIBOL	CHS1	UMP
TSHE/BENE/LIBOL	CHS1	UMP,ROR-C
TSHE/GASH-VAOV2	CHS1 33	SIU,OLY

WESTERN HEMLOCK/SWORDFERN-OXALIS (CHF1)

Western hemlock (TSHE) and Douglas-fir (PSME), often with western redcedar (THPL) and other species are in the tree canopy. Herbaceous layer has one or more of the following moist-site indicators: oxalis (OXOR), swordfern (POMU), foam flower (TITR), and vanilla leaf (ACTR). Warm sites with deep, rich soils that are moist much of the growing season. Reforestation is not difficult to establish, and trees grow very well, once established:

TSHE/OXOR (WIL)	CHF1 11	WIL
TSHE/OXOR (OLY)	CHF1 12	OLY
TSHE/OXOR (COAST)	CHF1 21	SIU
TSHE/POMU	CHF1 22	SIU
TSHE/POMU-OXOR	CHF1 24	MTH,GIP
TSHE/POMU (GIP)	CHF1 25	GIP
TSHE/POMU-OXOR (OLY)	CHF1 31	OLY
TSHE/POMU-TITR	CHF1 32	OLY,MBS
TSHE/POMU (WIL)	CHF1 51	WIL
TSHE/TITR	CHF2 22	GIP
TSHE/ACCI/POMU	CHS2 22	SIU
TSHE-CHLA	CHC1	SIS
TSHE-THPL	CHC4	SIS
TSHE-UMCA	CHH1	SIS

WESTERN HEMLOCK/FORB, MOIST (CHF3)

Western hemlock (TSHE), Douglas-fir (PSME), grand fir (ABGR) and western redcedar (THPL) are in the canopy. Herb-rich ground vegetation has moist-site indicators as beadrily (CLUN), vanillaleaf (ACTR), wild sasparilla (ARNU3). Warm, moist sites with relatively deep, rich soils. Reforestation is not difficult to establish and trees grow very well, once established:

TSHE/CLUN	CHF3 11	COL
TSHE/ARNU3	CHF3 12	COL
TSHE/GYDR	CHF4 22	COL
TSHE-ABGR/CLUN	CHC3 11	MTH

WESTERN HEMLOCK/RHODODENDRON, COOL (CHSC)

Western hemlock (TSHE) and Douglas-fir (PSME), often with western redcedar (THPL), are in the tree canopy. Pacific rhododendron (RHMA) and/or Alaska huckleberry (VAAL) with swordfern (POMU), oxalis (OXOR), dogwood bunchberry (COCA) or twinflower (LIBO2) common in understory. Fool's huckleberry (MEFE) occurs on some sites east of the Cascades. Warm to cool sites with some winter snowpack. Soils well-drained but not droughty, often nutrient limited. Reforestation is relatively easy to establish; tree growth moderate to good:

TSHE/RHMA-VAAL/COCA	CHS3 26	MTH,WIL
TSHE/RHMA/POMU	CHS3 35	OLY
TSHE/RHMA/OXOR	CHS3 54	WIL
TSHE/RHMA/LIBO2	CHS3 55	WIL
TSHE/VAAL/COCA	CHS6 15	MTH,GIP,WIL
TSHE/MEFE	CHS7 11	COL

WESTERN HEMLOCK/FORB, DRY**(CHF2)**

Western hemlock (TSHE) and Douglas-fir (PSME), often with western redcedar (THPL), are in tree canopy. Pacific silver fir (ABAM) can occur on Olympic Peninsula. Herb-rich understory, especially with vanillaleaf (ACTR) and swordfern (POMU). Dwarf Oregongrape (BENE) is common. Warm to cool sites without persistent snowpacks. Soils are deep, often stony, slightly droughty and productive. Reforestation can be moderately difficult to establish. Tree growth potential is good to moderate, once established:

TSHE-PIMO/VAME	CHC9	UMP,ROR-C
TSHE/POMU (MTH)	CHF1 23	MTH
TSHE/ACTR (OLY)	CHF2 11	OLY
TSHE/ACTR	CHF2 21	MTH,GIP,WIL
TSHE/BENE/ACTR	CHS1 14	WIL,ROR-C

WESTERN HEMLOCK/RHODODENDRON, MESIC (CHSM)

Western hemlock (TSHE) and Douglas-fir (PSME), often with western redcedar (THPL) occur in the tree canopy. Rhododendron (RHMA) is the most common shrub, but is replaced on some sites by Alaska huckleberry (VAAL), big huckleberry (VAME), or salal (GASH). Dwarf Oregongrape (BENE) and/or oceanspray (HODI) occur on some sites. Beargrass (XETE) is common. Warm to cool, relatively dry sites without persistent snowpacks. Soils usually stony, often shallow, and nutrient limited. Reforestation is moderately difficult to establish. Tree growth is poor to moderate, once established:

TSHE/XETE (COL)	CHF5 21	COL
TSHE/XETE (OLY)	CHF5 11	MBS,OLY
TSHE/GASH/XETE	CHS1 32	OLY,MBS
TSHE/GASH-HODI	CHS1 34	OLY,MBS
TSHE/RHMA/XETE (MTH)	CHS3 25	MTH
TSHE/RHMA/XETE (OLY)	CHS3 32	OLY
TSHE/RHMA/XETE (WIL)	CHS3 53	WIL
TSHE/RHMA (OLY)	CHS3 31	OLY
TSHE/RHMA-BENE (OLY)	CHS3 33	OLY
TSHE/RHMA-GASH (OLY)	CHS3 34	OLY
TSHE/VAME/XETE	CHS6 12	MTH
TSHE/VAAL/XETE	CHS6 22	OLY

WESTERN HEMLOCK/SALAL-OREGONGRAPE, DRY (CHSD)

Western hemlock (TSHE) and Douglas-fir (PSME), often with western redcedar (THPL), are in the tree layer. Dwarf Oregongrape (BENE) and/or salal (GASH) are in the understory. Swordfern (POMU) is not common or absent. Warm, relatively dry sites with moderately deep, somewhat stony soils. Reforestation can be moderately difficult to establish. The potential tree growth is moderate:

PSME-TSHE/BENE	CDC7 11	WIL
PSME-TSHE/GASH	CDC7 13	WIL
TSHE/Depauperate	CHF9 11	OLY,MBS
TSHE/GASH (GIP)	CHS1 28	GIP
TSHE/GASH (OLY)	CHS1 31	OLY,MBS
TSHE/GASH-BENE	CHS1 35	OLY,MBS
TSHE/BENE (OLY)	CHS1 38	OLY,MBS
TSHE/BENE	CHS1	WEN
TSHE-ACGL/SMST	CHS2	ROR-C

WESTERN HEMLOCK/SHRUB, DRY (CHC2)

Associations in which western hemlock (TSHE) is codominate with Douglas-fir (PSME). Vine maple (ACCI), dogwood (CONU), madrone (ARME) and/or oceanspray (HODI) are common in shrub layer. Vanilla leaf (ACTR) is usually common in herbaceous layer. Environments are warm and dry. Tree regeneration may be difficult to establish:

TSHE-PSME/HODI	CHC2 12	MTH,GIP
TSHE-PSME-ARME	CHC2 13	GIP
TSHE-ACCI/ACTR	CHS2 23	MTH
TSHE-CONU/ACTR	CHS2 24	GIP
TSHE/BENE-GASH (GIP)	CHS1 27	GIP
TSHE/ACCI	CHS2	WEN

WESTERN HEMLOCK/SHRUB-OXALIS (CHSF)

Western hemlock (TSHE) and Douglas-fir (PSME), often with western redcedar (THPL), occur in the tree layer. Very little Douglas-fir occurs in stands on the Olympic Peninsula unless planted. The understory has oxalis (OXOR) with salal (GASH), dwarf Oregongrape (BENE), Alaska huckleberry (VAAL) or big huckleberry (VAME). Warm to cool sites without persistent snowpacks. Soils are moderately deep, rich and moist. Reforestation is generally easy to establish. Sites have some of the best potential for tree growth:

TSHE-THPL/OXOR	CHC4	UMP
TSHE/GASH/OXOR	CHS1 36	OLY
TSHE/GASH/OXOR	CHS1	UMP
TSHE/VAAL/OXOR	CHS6 13	MTH,GIP
TSHE/VAAL/OXOR (OLY)	CHS6 23	OLY
TSHE/VAME/OXO	RCHS6	UMP
TSHE/BENE/OXOR	CHS1	UMP
TSHE/BENE/OXOR	CHS1 13	WIL

PACIFIC SILVER FIR SERIES

SILVER FIR/SALAL-OREGONGRAPE (CFS1)

Pacific silver fir (ABAM), Douglas-fir (PSME), western hemlock (TSHE), and western redcedar (THPL) occur in tree layer. Dwarf Oregongrape (BENE) and/or salal (GASH) dominant shrub layer. Herbaceous layer is not usually conspicuous. Cool sites with a winter snowpack and relatively dry, well-drained soils. Reforestation is relatively easy to establish and trees grow moderately, once established:

ABAM/BENE	CFS1	MBS
ABAM/BENE	CFS1 51	GIP,MTH,WIL
ABAM/GASH (GIP)	CFS1 52	GIP
ABAM/GASH (OLY)	CFS1 54	OLY,MBS
ABAM/Depauperate	CFF9 11	OLY
ABAM/BENE-LIBO2	CFS1	OKA,WEN
ABAM/GASH	CFS1	MBS

SILVER FIR/FORB, MESIC**(CFFM)**

Pacific silver fir (ABAM) occurs with western hemlock (TSHE) and western redcedar (THPL) in tree canopy. Noble fir (ABPR) or Shasta red fir (ABMASH), and Douglas-fir (PSME) commonly occur in the southern Washington and Oregon Cascades, but not the Olympic Peninsula. Moist-site herbs are common: foam flower (TIUN), oxalis (OXOR), vanillaleaf (ACTR), queencup beadleily (CLUN) and swordfern (POMU). Cool sites with a winter snowpack and moist, fertile soils. Reforestation is relatively easy to establish. Stands characterized by moderate to good tree growth:

ABAM/OXOR (OLY)	CFF1 11	OLY
ABAM/TIUN	CFF1 52	MTH,WIL,GIP
ABAM/OXOR	CFF1 53	MTH,WIL
ABAM/ACTR-TIUN	CFF2 11	OLY
ABAM/ACTR-CLUN	CFF2 53	GIP
ABAM/POMU	CFF6 11	OLY,MBS
ABAM/POMU-OXOR	CFF6 12	OLY
ABAM-ACCI/TIUN	CFS6 51	MTH,WIL
ABAM-ACCI/TITR	CFS6	UMP
ABAM-TSHE/CLUN	CFC2	UMP
ABAM/ACCI	CFS6	WEN
ABAM/ASCA3	CFF4	WEN
ABAM/ACTR	CFF2	WEN
TSHE-ABAM/VAME	CHC5	UMP

SILVER FIR/DEVIL'S CLUB**(CFS3)**

Pacific silver fir (ABAM) occurs with western redcedar (THPL) and western hemlock (TSHE). Noble fir (ABPR), and Douglas-fir (PSME) occur in Washington and Oregon Cascades, not Olympic Peninsula. Devil's club (OPHO) and skunkcabbage (LYAM) are common shrubs. Cool sites with a winter snow pack and moist to wet soils during the growing season. Stands are often associated with riparian areas. Difficult reforestation due to high water tables but tree growth is moderate to good:

ABAM/OPHO	CFS3 51	MTH,GIP,WIL
ABAM/OPHO (OLY)	CFS3 11	OLY,MBS
ABAM/LYAM	CFM1 11	OLY,MBS
ABAM/OPHO (WEN)	CFS3	WEN
ABAM/LYAM	CFM1	WEN

SILVER FIR/AZALEA-MENZIEZIA**(CFS5)**

Pacific silver fir (ABAM), Alaska cedar (CHNO), western hemlock (TSHE) and western redcedar (THPL) occur in overstory canopy. Noble fir (ABPR), and mountain hemlock (TSME), lodgepole pine (PICO) and western white pine (PIMO) are common associates in Washington and Oregon Cascades, not Olympic Peninsula. Cascades azalea (RHAL), fool's huckleberry (MEFE) or Alaska huckleberry (VAAL) are in shrub layer. Cool to cold sites with deep, persistent winter snowpack. Soils are moist to wet through the growing season. Difficult reforestation and slow tree growth due to elevation and short growing seasons:

ABAM/VAAL-RHAL	CFS2 20	OLY
ABAM/RHAL/CLUN	CFS5 52	MTH,WIL
ABAM/MEFE	CFS2 54	MTH,WIL,GIP
ABAM/RHAL	CFS5 50	GIP
ABAM/RHAL/XETE	CFS5 51	MTH,WIL
ABAM/RHAL (OKA)	CFS5 53	OKA,WEN
ABAM/MEFE	CFS2	WEN

SILVER FIR/SHRUB-BEARGRASS**(CFF3)**

Pacific silver fir (ABAM), noble fir (ABPR), lodgepole pine (PICO) and western white pine (PIMO) occur in the Oregon and Washington Cascades. Olympic Peninsula stands have subalpine fir (ABLA2), mountain hemlock (TSME), western redcedar (THPL) as associates. Big huckleberry (VAME) and beargrass (XETE) or beargrass alone occur in understory. Stands usually are herb-poor. Cool to cold sites with persistent winter snowpacks. Soils are well-drained, often stony. Sites are difficult to regenerate due to beargrass and huckleberry competition, and tree growth is slow:

ABAM/VAME/XETE	CFS2 51	MTH,WIL,GIP
ABAM/VAME/XETE	CFS2 11	OLY,MBS
ABAM/XETE	CFF3 11	OLY,MBS

SILVER FIR/RHODODENDRON**(CFS6)**

Pacific silver fir (ABAM), noble fir (ABPR), western hemlock (TSHE) occur with lodgepole pine (PICO) and western white pine (PIMO) in Washington and Oregon Cascades. Stands on Olympic Peninsula have Douglas-fir (PSME) and western hemlock (TSHE) associated with Pacific silver fir. Pacific rhododendron (RHMA) with Alaska huckleberry (VAAL), dwarf Oregongrape (BENE) and salal (GASH) are prominent shrubs. Cool sites with winter snowpacks. Soils are relatively deep, often stony, somewhat nutrient poor, but not particularly dry. Reforestation is moderately difficult to establish and tree growth is slow to moderate:

ABAM-TSHE/RHMA-GASH	CFC2 51	MTH,WIL
ABAM/RHMA-VAAL/COCA	CFS2 52	MTH,WIL
ABAM/RHMA (OLY)	CFS6 11	OLY
ABAM/RHMA-VAAL	CFS6 12	OLY
ABAM/RHMA-BENE	CFS6 52	MTH,WIL

SILVER FIR/RHODODENDRON/BEARGRASS (CFFS)

Pacific silver fir (ABAM), noble fir (ABPR), lodgepole pine (PICO) and western white pine (PIMO) occur in tree layer. Pacific rhododendron (RHMA), often with beargrass (XETE) occur in understory. Stands are herb poor. Cool sites with winter snowpacks. Soils are shallow, stony and nutrient-poor. Sites are difficult to reforest due to beargrass competition and tree growth is slow:

ABAM/RHMA/XETE	CFS6 53	MTH,WIL
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SILVER FIR/COASTAL**(CFSF)**

Pacific silver (ABAM) fir occurs with western hemlock (TSHE) and western redcedar (THPL). Shrub layer is dominated by either salal (GASH) or Alaska huckleberry (VAAL). Moist tending herbs or ferns dominate the ground vegetation: avalanche lily (ERMO), oxalis (OXOR), or deerfern (BLSP):

ABAM/GASH/BLSP	CFS1 55	OLY
ABAM/GASH/OXOR	CFS1 56	OLY
ABAM/VAAL/OXOR	CFS2 17	OLY
ABAM/VAAL/MADI2	CFS2	MBS
ABAM/VAAL/ERMO	CFS2 13	OLY,MBS
ABAM/VAAL/TITR	CFS2 15	OLY

SILVER FIR/SHRUB, MESIC**(CFSM)**

Pacific silver fir (ABAM) and western hemlock (TSHE), with minor amounts of Douglas-fir (PSME) occur in tree layer. Alaska huckleberry (VAAL), with herbs, particularly dogwood bunchberry (COCA) and queencup beadleily (CLUN), occur in understory. Cool sites with winter snowpacks. Soils are relatively deep and well-watered. Reforestation is moderately difficult to establish and tree growth, once established, is slow to moderate:

ABAM/VAAL (OLY)	CFS2 12	OLY
ABAM/VAAL/CLUN	CFS2 18	OLY,MBS
ABAM/VAAL/COCA	CFS2 53	MTH, WIL
ABAM/VAAL	CFS2 57	GIP
ABAM/VAAL	CFS2	WEN

SILVER FIR/SHRUB, COOL**(CFSC)**

Pacific silver fir (ABAM), Douglas-fir (PSME) and western hemlock (TSHE) occur in tree layer. Noble fir (ABPR) is found in Washington and Oregon Cascades. Alaska huckleberry (VAAL) with dwarf Oregon grape (BENE) and/or salal (GASH) occur in understory. Cool sites with winter snowpacks and moderately deep, well-drained soils. Drier than the silver fir/shrub, mesic group which also has Alaska huckleberry. Reforestation moderately difficult to establish and tree growth is slow to moderate:

ABAM/VAAL-BENE	CFS2 16	OLY
ABAM/VAAL/LIBO2	CFS2 19	OLY,MBS
ABAM/VAAL-GASH	CFS2 55	WIL,MTH,GIP
ABAM/VAAL-BENE	CFS2	MBS

SILVER FIR/SHRUB, DRY**(CFSD)**

Pacific silver fir (ABAM) occurs with western hemlock (TSHE) on the Olympic Peninsula, and with Douglas-fir (PSME) and noble fir (ABPR) in the Oregon and Washington Cascades. Big huckleberry (VAME), often with Alaska huckleberry (VAAL) occur in shrub layer. Herb layer is characterized by many species, the prominent ones being queencup beadlelily (CLUN) and/or beargrass (XETE). Cool sites with winter snowpacks. Soils are shallow and well-drained but moist early in the growing season. Reforestation is somewhat difficult and tree growth is slow to moderate:

ABAM/VAME	CFS2	MBS
ABAM/VAAL/XETE	CFS2 14	OLY,MBS
ABAM/VAME-VAAL	CFS2	MBS
ABAM/VAME/CLUN	CFS2 56	MTH,WIL,GIP
ABAM/VAME/RULA	CFS2	UMP
ABAM/PAMY	CFS2 58	OKA,WEN

SHASTA RED FIR SERIES**SHASTA RED FIR/GRASS-FORB****(CRF2)**

Associations dominated by Shasta red fir (ABMASH) and mountain hemlock (TSME) with currant (RIBES), and pinemat manzanita (ARNE) in shrub layer:

TSME/POPU	CMF2	ROR-C,SIS
ABMAS/POPU	CRF2	ROR-C,SIS
ABMAS/SHEEP	CRF3	ROR-S
ABMAS/CAPE	CRG1 11	WIN
ABMAS/ARNE/STOC	CRS1 11	WIN
ABMAS-TSME/ARNE/CAPE	CRS1 12	WIN

SHASTA RED FIR-WHITE FIR**(CRC3)**

Shasta red fir (ABMAS) and white fir (ABCO) growing in codominance. Shrub layer dominated by big huckleberry (VAME), Oregon grape (BENE), currant (RIBES), rose (ROGY), creeping snowberry (SYMO), prince's pine (CHUM) or golden chinquapin (CACH):

ABMAS-CADE3	CRC1	UMP,ROR-C
ABMAS/VAME	CRS4	UMP,ROR-C
ABCO-ABMAS/CHUM	CWC7	UMP,ROR-C
ABCO-ABMAS/BENE	CWC7	UMP,ROR-C
ABCO-ABMAS/RIBES	CWC7	SIS,ROR-S
ABCO-ABMAS/ROGY	CWC7	SIS,ROR-S
ABCO-ABMAS/SYMO	CWC7	SIS,ROR-S
ABMAS-ABCO/CACH-CHUM/CAPE	CRS3 11	WIN,ROR-C

SHASTA RED FIR-ALASKA CEDAR (CRC2)

Stands dominated by Shasta red fir (ABMAS) or white fir (ABCO) with Alaska cedar (CHNO). Environments with cold microsites occurring at high elevations or on ridgetop positions:

ABMAS-CHNO	CRC2	ROR-S,SIS
ABCO-CHNO	CWC9	ROR-C,UMP

SHASTA RED FIR-WHITE FIR/SADLER OAK (CRH1)

Shasta red fir (ABMAS) or white fir (ABCO) growing in association with sadler oak (QUSA). Environments are cool, dry and at relatively high elevations:

ABMAS-QUSA	CRH1	ROR-S,SIS
ABMAS/SYMO	CRS2	ROR-S,SIS
ABCO-QUSA/CHUM	CWH3	ROR-S,SIS
ABCO-QUSA/BENE-PAMY	CWH3	ROR-S,SIS
ABCO-QUSA/BENE	CWH3	ROR-S,SIS
ABCO-QUSA-CACH	CWH3	ROR-S,SIS

MOUNTAIN HEMLOCK SERIES

MOUNTAIN HEMLOCK/BIG HUCKLEBERRY (CMS2)

Mountain hemlock (TSME) often growing with Pacific silver fir (ABAM) and occasionally other high elevation tree species as lodgepole pine (PICO) or western white pine (PIMO). Big huckleberry (VAME) dominates shrub layer or occurs with Alaska huckleberry (VAAL). Beargrass (XETE) dominates ground cover in some associations. Cold sites with deep, persistent snowpacks and well-drained, often stony or pumice-derived soils. Very difficult to regenerate and tree growth is usually slow:

TSME/VAME (GIP)	CMS2 10	GIP,MBS
TSME/VAME (WAW)	CMS2 31	WAW
TSME/VAME	CMS2	WEN,OKA
TSME/VAME/XETE	CMS2 16	MTH,WIL
TSME/VAME/XETE (OLY)	CMS2 45	OLY,MBS
TSME/VAAL/XETE	CMS2 43	OLY
TSME/XETE	CMF1	WEN

MOUNTAIN HEMLOCK/WOODRUSH (CMG2)

Mountain hemlock (TSME), often with Pacific silver fir (ABAM), in the tree layer. Woodrush (LUHI) is common as ground vegetation. Very cold sites with deep persistent snowpacks and well-drained soils. Very difficult to regenerate trees and very slow tree growth, especially following establishment:

TSME/LUHI	CMG2 11	WIL,DES
TSME/LUHI	CMG2	WEN,OKA

MOUNTAIN HEMLOCK/GROUSE HUCKLEBERRY (CMS1)

Mountain hemlock (TSME) usually dominates tree overstory, often growing in association with Pacific silver fir (ABAM), lodgepole pine (PICO), and western white pine (PIMO). Grouse huckleberry (VASC) or pinemat manzanita (ARNE) dominate the shrub layer. Long-stolon sedge (CAPE) is prevalent ground cover in central and southern Oregon Cascades. Cold sites with deep, persistent snowpacks and well-drained, often stony or coarse pumice soils. Very difficult reforestation and very slow tree growth. Stand basal areas often quite high:

TSME/VASC	CMS1 14	MTH,WIL,UMP,ROR-C
TSME/VASC/CAPE	CMS1 11	WIN,DES
TSME/VASC (WAW)	CMS1 31	WAW
TSME/ARNE	CMS1	UMP,ROR-C
ABMAS-TSME/VASC	CRS1 12	WIN,ROR-C
ABMAS-TSME/ARNE	CRS1 11	WIN,ROR-C
PICO-TSME-ABMAS	CLC5	UMP,ROR-C
ABMAS/CAPE	CRG1 11	WIN,ROR-C

MOUNTAIN HEMLOCK/RHODODENDRON (CMS6)

Mountain hemlock (TSME), usually growing in association with Pacific silver fir (ABAM) and occasionally other high elevation species. Pacific rhododendron (RHMA), often with beargrass (XETE) are in understory. Cold sites with deep, persistent snowpacks and stony, nutrient poor soils. Very difficult to achieve adequate tree stocking and tree growth is very slow, once established:

TSME/RHMA	CMS6 12	WIL,UMP
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MOUNTAIN HEMLOCK ALPINE PARKS (CAXX)

Mountain hemlock (TSME) occurs as high elevation savanna in pure clumps or mixed with whitebark pine (PIAL) and/or subalpine fir (ABLA2). Environments are very cold, and dry. Soils are often derived from volcanic extrusives in Oregon Cascades but of various parent materials in Washington:

TSME/PHEM-VADE	CMS3 11	OLY,MBS,GIP,MTH,WIL,DES, WIN
ABLA2-PIAL/CAGE	CAG1 11	OCH,MAL
PIAL/CAGE	CAG1 12	OKA
LALY (OKA)	CAC1	OKA
PICO-PIAL/PELA	CLC1 11	FRE
PICO-PIAL-PIMO/ARCO2	CLC1 12	FRE

MOUNTAIN HEMLOCK/FORB, COOL (CMFC)

Mountain hemlock (TSME) occurs in the canopy. Shasta red fir (ABMAS) is common. Moist-site indicating herbs occur in understory: foam flower (TIUN), dwarf bramble (RULA). Cold sites with deep, persistent snowpacks. Soils moist throughout growing season. Tree regeneration is very difficult to establish and very slow tree growth:

TSME/RULA	CMS5	UMP
TSME/RULA	CMS5	WEN,OKA
TSME/VAME	CMS2	ROR-C
TSME-ABCO-ABMAS	CMC2	ROR-C
ABCO-TSME	CWC9	ROR-C,UMP

MOUNTAIN HEMLOCK/ALASKA HUCKLEBERRY (CMSC)

Mountain hemlock (TSME) and Pacific silver fir (ABAM), often with Alaska cedar (CHNO), occur in tree layer. Cascades azalea (RHAL), fool's huckleberry (MEFE), devil's club (OPHO), salmonberry (RUSP) and moist-site herbs occur in understory. Cold sites with deep, persistent snow packs. Soils moist through the growing season. Tree regeneration is very difficult to establish and tree growth is very slow:

TSME/VAAL	CMS2 41	OLY
TSME/VAAL/ERMO	CMS2 42	OLY
TSME/VAME-VAAL	CMS2 44	OLY
TSME/CLPY/BLSP	CMSX	MBS
TSME/TIUN-STRO	CMF2	MBS
TSME/RHAL-VAME	CMS3 12	OLY,MBS
TSME/MEFE (GIP)	CMS2 21	GIP
TSME/RHAL	CMS3 23	GIP

MOUNTAIN HEMLOCK/DEVIL'S CLUB (CMS4)

Mountain hemlock (TSME) growing at high elevations with deep persistent snowpacks and imperfectly-drained soils. Ground vegetation is dominated by wet site shrubs as devil's club (OPHO) and herbs as marshmarigold (CABI):

TSME/OPHO	CMS4	MBS
TSME/CABI	CMF2	MBS

SUBALPINE FIR SERIES

SUBALPINE FIR/PINEGRASS-SHRUB (CEG3)

Subalpine fir (ABLA2) is climax potential and often associated with lodgepole pine (PICO). Shrubs, if present, tend to be low in stature with pinegrass (CARU) as the dominant species in ground vegetation. This group represents relatively dry and frosty sites that are difficult to reforest:

ABLA2/CARU	CEG3 11	OKA,COL,WEN
ABLA2/CARU	CEG2 12	WAW
ABLA2/VASC/CARU (OKA)	CES4 13	OKA,WEN
ABLA2/VACCI	CES3 12	OKA,COL
ABLA2/VACA	CES4 22	COL
ABLA2/POPU	CEF4 11	WAW

SUBALPINE FIR/WOODRUSH (CEG1)

Subalpine fir (ABLA2) is the climax potential with smooth woodrush (LUHI) as the main herbaceous species. Delicious blueberry (VADE) may dominate the shrub layer. High elevation sites with deep, persistent snowpacks and severe reforestation problems. Tree growth is slow:

ABLA2/LUHI	CAG1	OKA,WEN
ABLA2/VADE	CES4	OKA,WEN

SUBALPINE FIR/AZALEA (CES2)

Subalpine fir (ABLA2) is climax potential, usually associated with Engelmann spruce (PIEN). Sites are not well suited to Douglas-fir regeneration. Lodgepole pine (PICO) may dominate some early seral stands. Cascade azalea (RHAL), or rusty menziesia (MEFE) are the most abundant shrubs, often with huckleberry (VAME) or beargrass (XETE). Environments are cool, moist to wet located at upper elevations. Tree growth is poor to moderate:

ABLA2/RHAL	CES2 11	OKA,COL,WEN
ABLA2/RHAL-XETE	CES2 10	COL
ABLA2/MEFE	CES2 21	WAW
ABLA2/RHAL (OLY)	CES2 12	OLY

SUBALPINE FIR/HUCKLEBERRY (CES3)

Subalpine fir (ABLA2) is climax potential often associated with Douglas-fir (PSME), Engelmann spruce (PIEN), western larch (LAOC), and lodgepole pine (PICO). Medium to tall shrubs as big huckleberry (VAME) and pachistima (PAMY) are common. Soils are well-drained. Reforestation may be difficult because of shrub competition for available moisture:

ABLA2/VAME (COL)	CES3 14	COL
ABLA2/XETE	CEF1 11	COL
ABLA2/PAMY (OKA)	CES1 11	OKA,WEN
ABLA2/VAME (BLUES)	CES3 11	OCH,MAL,UMA,WAW
ABLA2-PIEN/VAME	CEC2	OCH,MAL,UMA,WAW
ABLA2/VAME (WAW)	CES3 15	WAW
ABLA2/VAME (OLY)	CES2 21	OLY

SUBALPINE FIR/WHORTLEBERRY (CES4)

Subalpine fir (ABLA2) is the climax potential with a variety of low shrubs representative of droughty, frost-prone, nutrient-poor sites. Lodgepole pine (PICO) dominates most stands with subalpine fir or Engelmann spruce (PIEN) regenerating underneath the lodgepole overstory. Grouse whortleberry (VASC) usually dominates the shrub layer. Severe regeneration problems due to frost and droughty soils at high elevations. Tree growth is poor:

ABLA2/PHEM	CES6 11	OKA,WEN
ABLA2/VASC	CES4 12	OKA,COL,WEN
ABLA2/ARUV	CES4	OKA,WEN
ABLA2/VASC (BLUES)	CES4 11	OCH,MAL,UMA,WAW
ABLA2-PIEN/VASC	CEC2	OCH,MAL,UMA,WAW
ABLA2/VASC/POPU	CES4 15	WAW
ABLA2/JUCO4	CES4	MTH,WIL
ABLA2/JUCO4	CES6 21	OLY
ABLA2/LULA	CEF3 21	OLY

SUBALPINE FIR/FORB, WET (CEFW)

Subalpine fir (ABLA2) is the climax potential usually with Engelmann spruce (PIEN) as codominant. Other conifers as Douglas-fir (PSME), western larch (LAOC) and lodgepole pine (PICO) may be present. Wet site herbs as claspleaf twistedstalk (STAM) and false bugbane (TRCA3) typify the understory. Sitka alder (ALSI) may be a common seral shrub. Sites have fertile, moist to wet soils and cool to cold temperatures during growing season. Regeneration is difficult to establish due to wet soils. Tree growth is poor to moderate:

ABLA2/TRCA3	CEF4 22	COL,OKA
ABLA2/STAM	CEF3 11	WAW

SUBALPINE FIR/FORB, MESIC (CEFM)

Subalpine fir (ABLA2) is the climax potential usually being associated with Engelmann spruce (PIEN), Douglas-fir (PSME), lodgepole pine (PICO), western larch (LAOC), and western white pine (PIMO). The understory is dominated by herbs or subshrubs as bunchberry (COCA), twinflower (LIBO2), beadlelily (CLUN) and arnica (ARCO). Environments are moist, but well-drained soils with cool to frosty air temperatures during growing season. Reforestation is not difficult provided soils are not compacted or frost pocket created during harvest. Tree growth is slow to moderate:

ABLA2/COCA	CEF4 23	COL,OKA
ABLA2/LIBO2	CEF2 11	OKA,COL,WEN
ABLA2/CLUN	CEF4 21	COL
ABLA2/ARCO	CEF4	OCH,MAL,UMA
ABLA2/LULA	CAG3	MTH,WIL
ABLA2/LIBO2	CEF2 21	WAW
ABLA2/CLUN	CEF4 12	WAW

SUBALPINE LARCH SERIES

ALPINE LARCH (CAC1)

Closed forest sites at high elevations with subalpine larch (LALY) as the climax dominant species in tree layer. A variety of shrubs and herbs may be present. The most common shrub is mountain heather (PHEM) and smooth woodrush (LUGL) as the herb. The highest elevation closed forests in the Pacific Northwest. Sites are severe with very deep snowpacks, frost and short growing seasons. Tree growth is very slow. Regeneration in subalpine fir stands following a catastrophic disturbance may require centuries to occur:

LALY	CAC1	OKA,WEN
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ENGELMANN SPRUCE SERIES

ENGELMANN SPRUCE WETLANDS (CEM0)

Very moist to wet sites with Engelmann spruce (PIEN) as the indicated climax species. Black cottonwood (POTR2) may be present. A rich herb layer dominated by species as horsetail (EQAR), claspleaf twisted stalk (STRO) and miterworts typify the understory. Regeneration may be very difficult on many sites, especially those with horsetails (Equisetum sp.) because of seasonally high water tables. Old logs and rootwads are important microsites for establishment of tree regeneration. Tree growth is low to moderate:

PIEN/EQUIS	CEM2 11	OKA,COL,WEN
PIEN/WETLAND	CEM2	MAL,UMA
PIEN/CAEU	CEM1 11	DES,WIN
PIEN/EQAR-STRO	CEM2 21	DES,WIN
PIEN/CLUN	CEM2 22	DES,WIN,OCH
PIEN/VAOC2/FORB	CEM3 11	DES,WIN
PIEN/VAOC2/CAEU	CEM3 12	DES,WIN
PIEN BOTTOMLANDS	CWS9 11	DES

BLACK COTTONWOOD-ASPEN SERIES

BLACK COTTONWOOD (HCXX)

Associations occurring at low elevation in riparian areas:

POTR2/SYAL-COST	HCS3	COL,WEN,OKA
POTR2-PIEN/ALIN-COST	HCC1 11	WIN
POTR2/CAEU	HCG1 11	DES
POTR2/SYAL/POPR	HCS3 11	OCH

ASPEN/SNOWBERRY**(HQS2)**

Associations occurring on imperfectly drained soils along margins of meadows and on concave to flat microrelief at bottom slope positions:

POTR/SYAL	HQS2 11	COL,WEN,OKA
POTR/SYAL/ELGL	HQS2 21	DES,WIN,FRE,OCH
POTR/SPDO/CAEU	HQM4 11	DES,WIN,FRE
POTR-PICO/SPDO	HQC1 11	DES,WIN,FRE
POTR-PICO/ARUV	HQC1 12	DES,WIN,FRE

ASPEN/PINEGRASS**(HQG1)**

Associations occurring on relatively well-drained soils, often at high elevations:

POTR/CARU	HQG1 11	COL,WEN,OKA
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ASPEN/SEDGE WETLAND**(HQM0)**

Associations occurring on poorly-drained soils, often a component of riparian areas:

POTR/CALA3	HQM2 11	DES,WIN,FRE,OCH
POTR/ELGL	HQM1 21	DES,WIN,FRE,OCH

APPENDIX 3

Ecological Land Classification and Ecoregions

1. Driscoll, Richard S., Daniel L. Merkel, and David L. Radloff, Dale E. Snyder, James S. Hagihara. 1984. An ecological land classification framework for the United States. USDA Forest Service, Misc. Pub. No. 1439, Washington, D.C. 56pp, illus.
2. Bailey, Robert G. 1980. Description of the ecoregions of the United States. USDA Forest Service, Misc. Pub. No. 1391. Washington, D.C., 77pp, illus., map.

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Application of the Ecological Land Classification Framework to Plant Associations in the Pacific Northwest

Plant associations characterized by productivity data in Washington and Oregon have been organized according to the vegetation component of the "Ecological Land Classification Framework for the United States" (Driscoll et al. 1984).

All associations are characterized by herbage production (pounds per acre). Forest associations are further characterized by site index (SI) at age 100 (ft) for the primary association species, growth basal area (GBA) at age 100 (ft² per acre) for the primary association species, and cubic volume stand growth index (ft³) for the association (cubic feet per acre per year).

Association data are summarized by formation and then by series in an attempt to demonstrate quantitative characteristics of the vegetation component. A summary table following the basic classification shows a comparison of series which occur in more than one formation.

Coniferous trees can grow in several formations. For example, ponderosa pine can occur in: IA9b--evergreen needle-leaved closed forest with rounded crowns; IIA2a--evergreen needle-leaved woodland with rounded crowns; VB1e--medium-tall grassland with evergreen trees and semideciduous shrubs; and in VC1e--short grassland with evergreen trees and semideciduous shrubs. GBA was used to identify formations as follows: IA9b--closed forest (over 60 percent canopy cover) for GBA's greater than 75 ft² basal area per acre; IIA2a--woodland (26 to 60 percent canopy cover) for GBA's between 35 and 75 ft²; and VB1e and VC1e--grassland with some trees (10 to 25 percent canopy cover) for GBA's less than 35 ft² basal area per acre.

Formations	Description	SI GBA		FT ³	Herbage
IA9a	Giant conifer forest	139	461	285	563
IA9b	Closed conifer, rounded crowns	86	233	98	213
IA9c	Closed conifer, conical crowns	77	242	103	157
IB3b	Montane cold-deciduous forest	88	185	74	959
IIA2a	Conifer woodland, rounded crowns	63	59	24	200
IIIA1c	Broad-leaved evergreen shrubland				366
IIIB3a	Temperate deciduous shrubland				506
IIIB3b	Subalpine deciduous shrubland				282
VB1e	Medium-tall grassland, conifers	57	27	10	404
VB2c	Medium-tall grassland, deciduous shrubs				173
VB2b	Medium-tall grassland, semideciduous shrubs				359
VB4a	Medium-tall grassland, sodgrasses				1400
VB4b	Medium-tall grassland, bunchgrass				1108
VC1e	Short grassland, conifers	65	34	15	128
VC2b	Short grassland, semideciduous shrubs				178
VC5a	Short grassland, sodgrasses				391
VC5b	Short grassland, bunchgrasses				184
VC6a	Mesophytic grasslands (meadows)				2003
VC6b	Subalpine meadows				949
VD2a	Perennial flowering forbs				776

**Formation: IA9a--Evergreen needle-leaved closed forest, giant forest
(taller than 150 ft)**

Series: Pacific silver fir (ABAM)

		SI	GBA	FT ³	Herbage
CFF1 52	ABAM/TIUN	125	398	248	478
CFF1 53	ABAM/OXOR	130	410	300	500
CFF2 53	ABAM/ACTR-CLUN	130	415	266	488
CFS2 56	ABAM/VAME/CLUN	118	450	284	225
CFS3 51	ABAM/OPHO	131	420	281	500
CFS6 51	ABAM/ACCI/TIUN	137	480	350	478
		128	429	288	445 Series Mean

Series: Douglas-fir (PSME)

CDS2 12	PSME/HODI/GRASS	121	312	166	169
CDS6 12	PSME-ABCO/SYAL/LIBO2	121	190	140	10
CDS6 13	PSME-ABCO/SYAL/FORB	125	245	160	10
CDC7 11	PSME-TSHE/BENE	145	400	255	149
CDC7 13	PSME-TSHE/GASH	138	404	223	200
CDC7 12	PSME-TSHE/RHMA	133	317	169	116
		130	309	179	158 Series Mean

Series: White fir (ABCO)

CWH1 12	ABCO/CACH/PAMY/CHUM	116	237	144	100
CWS9 11	PIEN-ABCO/BOTTOMS	129	186	120	50
		122	211	132	75 Series Mean

Series: Grand fir (ABGR)

CWC3 11	ABGR-ABAM/SMST	133	496	264	220
CWF1 11	ABGR/CHUM	132	---	---	299
CWS5 22	ABGR/BENE	131	370	194	384
CWS9 12	ABGR/ACGL	115	375	180	80
		128	414	246	246 Series Mean

Series: Sitka Spruce (PISI)

CSF1 21	PISI/POMU	161	913	587	1390
CSF3 21	PISI/OXOR	169	875	591	1930
CSS2 21	PISI/MEFE-VAPA	175	747	522	816
CSS3 21	PISI/GASH	164	484	317	525
CSS5 22	PISI/RUSP-GASH	155	632	391	975
CSS5 21	PISI/RUSP	174	567	394	1249
CSS6 21	PISI/OPHO	170	660	448	1570
		168	697	464	1208 Series Mean

Series: Western hemlock (TSHE)

		SI	GBA	FT ³	Herbage
CHF1 11	TSHE/OXOR-WILL	158	477	301	608
CHF1 21	TSHE/OXOR-COAST	122	558	272	1630
CHF1 22	TSHE/POMU-COAST	124	591	293	1391
CHF1 23	TSHE/POMU-MTH	135	466	251	1000
CHF1 24	TSHE/POMU-OXOR	157	463	291	1061
CHF1 25	TSHE/POMU	161	504	324	633
CHF1 51	TSHE/POMU-WILL	159	389	247	205
CHF2 21	TSHE/ACTR	139	402	223	335
CHF2 22	TSHE/TITR	163	564	368	620
CHF3 21	TSHE/LIBO2	148	525	311	266
CHF4 21	TSHE/ATFI	166	601	399	1701
CHM1 21	TSHE/LYAM	120	408	195	770
CHS1 11	TSHE/GASH-WILL	137	385	211	241
CHS1 13	TSHE/BENE/OXOR	159	524	333	647
CHS1 14	TSHE/BENE/ACTR	158	476	301	262
CHS1 21	TSHE/BENE-COAST	115	538	247	975
CHS1 23	TSHE/GASH-COAST	121	468	226	708
CHS1 24	TSHE/BENE-GASH	131	440	230	380
CHS1 25	TSHE/BENE	125	380	190	91
CHS1 26	TSHE/BENE/POMU	142	401	228	584
CHS1 27	TSHE/BENE-GASH-GP	127	381	193	162
CHS1 28	TSHE/GASH	117	317	148	274
CHS2 21	TSHE/ACCI-GASH-COAST	123	452	222	1737
CHS2 22	TSHE/ACCI/POMU-COAST	126	412	207	1488
CHS2 23	TSHE/ACCI/ACTR	134	472	252	1000
CHS2 24	TSHE/CONU/ACTR	135	420	227	270
CHS3 26	TSHE/RHMA-VAAL/COCA	120	517	248	680
CHS3 28	TSHE/RHMA/BENE-MTH	115	388	178	125
CHS3 51	TSHE/RHMA/GASH-WILL	128	350	179	88
CHS3 52	TSHE/RHMA/BENE-WILL	136	482	262	90
CHS3 53	TSHE/RHMA/XETE-WILL	122	336	164	419
CHS3 54	TSHE/RHMA/OXOR	135	495	267	360
CHS3 55	TSHE/RHMA/LIBO2	130	447	232	20
CHS4 21	TSHE/RUSP-COAST	123	528	259	1462
CHS4 22	TSHE/RUSP/ACCI	130	421	218	1488
CHS4 23	TSHE/RUSP-GASH-COAST	123	341	167	855
CHS5 11	TSHE/OPHO-WILL	168	466	313	1106
CHS5 21	TSHE/OPHO-COAST	130	510	265	1530
CHS5 22	TSHE/OPHO/OXOR	161	335	215	1600
CHS5 23	TSHE/OPHO/SMST	146	212	123	1400
CHS5 24	TSHE/OPHO/POMU	172	556	382	1317
CHS6 10	TSHE/VAOV2-COAST	118	458	216	912
CHS6 11	TSHE/VAAL-OPHO	156	630	393	1300
CHS6 13	TSHE/VAAL/OXOR	136	437	238	1313
CHS6 14	TSHE/VAAL/GASH	123	396	195	308
CHS6 15	TSHE/VAAL/COCA	135	349	188	278
		137	458	248	758 Series Mean
		139	461	285	563 Formation
					Mean

Formation: IA9b--Evergreen needle-leaved closed forest, rounded crowns

Series: Douglas-fir (PSME)

		SI	GBA	FT ³	Herbage
CDG1 11	PIPO-PSME/CAGE	70	84	31	341
CDG1 21	PSME/CARU	82	195	65	300
CDG1 23	PSME/ARUV-OKAN	57	102	35	64
CDG1 31	PSME/CARU-OKAN	77	178	68	200
CDS2 11	PSME/HODI/BENE	115	311	143	10
CDS2 13	PSME/HODI/WIMO	106	290	135	120
CDS4 11	PSME/PAMY	86	225	100	27
CDS6 11	PIPO-PSME/SYAL-HODI	71	139	58	384
CDS6 14	PSME-ABCO/SYAL/CARU	112	140	101	10
CDS6 22	PSME/SYAL-WALLO	76	170	50	150
CDS6 23	PSME/SYOR-WALLO	78	150	50	150
CDS6 31	PSME/ARUR-PUTR	66	84	28	74
CDS6 32	PSME/SYOR-OKAN	82	136	56	110
CDS6 33	PSME/SYAL-OKAN	98	314	153	66
CDS6 34	PSME/SPBE	80	160	50	315
CDS7 11	PSME-PIPO/PHMA	72	121	49	296
CDS7 15	PSME/PHMA-OKAN	73	166	60	71
CDS7 16	PSME/PHMA-COLV	86	228	78	56
CDS7 17	PSME/PHMA-LIBO2	80	192	61	109
CDS7 22	PSME/ACGL/PHMA	102	160	70	150
CDS8 11	PSME/VACCI	73	144	56	77
		83	176	71	155 Series Mean

Series: Lodgepole pine (PICO)

CLC1 11	PICO-PIAL/PELA	51	99	29	50
CLC1 12	PICO-PIAL/ARCO2	40	90	18	50
CLF1 11	PICO/FORB	72	94	38	150
CLG2 11	PICO/CARU-VASC	68	110	45	274
CLG3 13	PICO/STOC-LINU-PUM	75	82	43	73
CLG3 15	PICO/FRVI-FEID	73	135	54	150
CLG4 11	PICO/CAPE-LUCA-PUM	81	119	74	137
CLG4 12	PICO/CAPE-PEEU-PUM	83	134	78	50
CLG4 15	PICO/SIHY-CAPE	66	79	29	50
CLH1 11	PICO-POTR/FRVI	79	180	77	150
CLM1 11	PICO/CANE-PUM	84	109	66	1225
CLM1 12	PICO/POPR	91	190	69	1066
CLM1 13	PICO/CAEU	94	178	67	2187
CLM1 14	PICO/CAAQ	75	199	60	1800
CLM2 11	PICO/ARUV	70	142	40	33
CLM3 11	PICO/VAOC-PUM	78	98	54	105
CLM3 12	PICO/VAOC2/CAEU	89	169	60	864
CLM3 13	PICO/SPDO-FORB	84	202	68	250
CLM3 14	PICO/SPDO/CAEU	97	188	73	1200
CLM4 11	PICO/XETE-PUM	93	126	82	400
CLS2 12	PICO/PUTR/STOC-PUM	85	107	57	16
CLS2 14	PICO/PUTR/FEID-PUM	75	83	43	75
CLS2 15	PICO/RICE-PUTR/STOC-PUM	67	60	33	10

		SI	GBA	FT ³	Herbage
CLS4 11	PICO/VASC-BLUES	60	92	35	116
CLS4 12	PICO/VASC-PUM	75	82	46	10
CLS4 13	PICO/VASC-FORB	90	161	80	100
CLS4 14	PICO/VASC/CAPE	71	105	37	100
CLS5 11	PICO/VAME	54	97	33	200
CLM9 11	PICO-PIEN/ELPA2	58	76	18	970
		75	124	52	409 Series Mean

Series: Ponderosa pine (PIPO)

CPC2 11	PIPO-JUOC/CELE/FEID	76	108	47	250
CPF1 11	PIPO/WYMO	78	100	44	125
CPG1 31	PIPO/FEID-WALLO	77	85	28	220
CPG1 32	PIPO/AGSP-WALLO	75	75	25	240
CPH3 11	PIPO-POTR/POPR	78	124	55	1200
CPS1 21	PIPO/ARTR/PONE	76	99	42	75
CPS2 11	PIPO/PUTR/FEID-PUM	76	79	42	121
CPS2 12	PIPO/CAPE-FEID	92	123	79	302
CPS2 17	PIPO/PUTR/FEID-AGSP	71	80	40	93
CPS2 18	PIPO/PUTR/SIHY-RYHO	71	80	40	93
CPS3 11	PIPO/PUTR-CEVE/STOC-PUM	81	92	53	10
CPS3 12	PIPO/PUTR-CEVE/CAPE-PUM	84	94	55	71
CPS3 14	PIPO/PUTR-CEVE/CAPE	83	94	55	71
CPS5 11	PIPO/SYAL-FLOOD	95	187	71	699
CPS5 22	PIPO/SYAL-WALLO	78	100	34	600
CPS5 23	PIPO/SPBE	76	90	30	80
		78	94	45	250 Series Mean

Series: White fir (ABCO)

CWC1 11	ABCO-PIPO-CADE/AMAL	81	265	114	10
CWC2 11	ABCO/CEVE-CACH/PTAQ	90	103	66	80
CWC2 12	ABCO/CEVE-CACH/CARU	110	140	105	80
CWC2 13	ABCO/CEVE/CAPE-PTAQ	81	95	54	80
CWC2 15	ABCO/PSME-CEVE/ARUV	100	240	140	10
CWC3 11	ABCO-PICO/STOC-CAPE	77	102	88	40
CWC4 11	ABCO-PIPO-PIMO/RICE	80	226	100	10
CWC4 12	ABCO-PIPO-PILA/ARPA	90	240	125	10
CWF4 31	ABCO/CLUN	110	316	139	227
CWH1 11	ABCO/CEVE-CACH/STOC	85	91	47	40
CWM1 11	ABCO/ALTE/SYAL	110	220	173	800
CWH2 11	ABCO-PIPO-POTR/CAREX	78	136	59	1200
CWS1 12	ABCO/CEVE-ARPA-PUM	79	89	50	10
CWS1 13	ABCO/ARPA-SYAL/CAPE	83	165	97	30
CWS1 14	ABCO/CEVE-PUM	85	77	44	10
CWS1 15	ABCO/CEVE/CAPE	83	97	77	28
CWS1 16	ABCO/CEVE/CEPR-FRVI	91	81	42	10
CWS1 17	ABCO-PIPO/ARPA/BERE	93	250	131	20
CWS3 12	ABCO/SYAL/FRVI	95	128	69	10
CWS3 13	ABCO-PIPO/SYAL/STJA	88	240	116	20
		88	157	88	135 Series Mean

Series: Grand fir (ABGR)

s: Grand fir (ABGR)		SI	GBA	FT³	Herbage
CWF3	11 ABGR/LIBO2-FORB	85	218	115	208
CWF4	11 ABGR/CLUN	89	350	124	28
CWF4	21 ABGR/CLUN-WALLO	108	325	150	80
CWG1	11 ABGR/CARU-RESID	82	103	43	309
CWG1	12 ABGR/CARU-ASH	83	140	53	330
CWS2	11 ABGR/VAME	78	168	79	301
CWS2	21 ABGR/VACA	85	213	72	122
CWS3	21 ABGR/SPBE	103	300	130	80
CWS4	11 ABGR/PHMA	78	271	84	13
CWS4	12 ABGR/AGGL/PHMA	77	210	65	80
CWS5	21 ABGR/ARUV	86	213	73	360
CWS8	11 ABGR/VASC	70	152	59	248
		89	278	104	109 Series Mean

Series: Western red cedar (THPL)

CCF2	12	THPL/ARNU3	97	415	161	109
CCF4	11	THPL/CLUN	69	324	89	36
CCS2	11	THPL/OPHO-COLV	101	711	287	207
CCS3	11	THPL/VACCI	81	298	96	53
			87	437	159	101 Series Mean

Series: Western hemlock (TSHE)

CHC2	12	TSHE-PSME/HODI	113	372	168	350
CHC2	13	TSHE-PSME/ARME	105	385	161	125
CHF3	11	TSHE/CLUN-COLV	98	356	139	16
CHF4	11	TSHE/GYDR-COLV	104	545	226	64
CHF5	11	TSHE/XETE	88	381	134	4
CHS1	22	TSHE/BENE-GASH-COAST	113	502	226	697
CHS3	21	TSHE/RHMA/BENE-COAST	100	398	159	392
CHS3	22	TSHE/RHMA/GASH-COAST	113	429	193	562
CHS3	23	TSHE/RHMA/POMU	111	504	223	196
CHS3	24	TSHE/RHMA/VAOV2-COAST	113	406	183	333
CHS3	25	TSHE/RHMA/XETE	94	250	94	300
CHS3	27	TSHE/RHMA/GASH	112	299	133	150
CHS4	11	TSHE/RUPE	94	379	142	48
CHS6	12	TSHE/VAME/XETE	88	170	59	580
CHS6	21	TSHE/VAMY	87	225	78	156
CHS7	11	TSHE/RHAL	75	298	89	33
			100	369	169	313 Series Mean
			86	233	98	213 Formation Mean

Formation: IA9c--Evergreen needle-leaved forest, conical crowns

Series: Subalpine fir (ABLA2)

		SI	GBA	FT ³	Herbage
CEF1 11	ABLA2/XETE-COLV	50	260	52	6
CEF2 11	ABLA2/LIBO2-OKAN	92	250	133	24
CEF2 21	ABLA2/LIBO2	76	190	62	80
CEF3 11	ABLA2/STAM	84	180	70	80
CEF4 12	ABLA2/CLUN	90	180	70	80
CEG2 11	ABLA2/CARU-OKAN	67	170	82	253
CES1 11	ABLA2/PAMY-OKAN	85	260	138	28
CES2 11	ABLA2/RHAL	72	165	78	86
CES2 12	ABLA2/RHAL-COLV	67	235	63	34
CES2 21	ABLA2/MEFE	65	150	40	80
CES3 11	ABLA2/VAME	62	142	55	292
CES3 12	ABLA2/VACCI	90	185	84	50
CES3 15	ABLA2/VAME-WALLO	70	160	70	80
CES4 11	ABLA2/VASC-BLUES	52	100	29	181
CES4 12	ABLA2/VASC-OKAN	59	188	56	11
CES4 13	ABLA2/VASC/CARU-OKAN	50	169	42	331
CES4 15	ABLA2/VASC/POMU	78	190	60	80
		72	193	61	65 Series Mean

Series: Engelmann spruce (PIEN)

CEM1 11	PIEN/CAEU	80	230	74	1480
CEM2 11	PIEN/EQAR	64	244	122	315
CEM2 21	PIEN/EQAR-STRO	90	258	93	1275
CEM2 22	PIEN/CLUN	105	305	128	326
CEM3 11	PIEN/VAOC2-FORB	85	233	79	69
CEM3 12	PIEN/VAOC2/CAEU	76	161	49	2350
		83	238	91	969 Series Mean

Series: Pacific silver fir (ABAM)

CFC2 51	ABAM-TSHE/RHMA/GASH	101	276	138	175
CFS1 51	ABAM/BENE	68	252	117	576
CFS1 52	ABAM/GASH	93	324	167	162
CFS2 51	ABAM/VAME/XETE	94	335	156	246
CFS2 53	ABAM/VAAL/COCA	110	407	224	305
CFS2 54	ABAM/MEFE	73	282	106	242
CFS2 55	ABAM/VAAL/GASH	72	420	147	225
CFS2 57	ABAM/VAAL	104	250	126	202
CFS5 50	ABAM/RHAL	89	245	113	678
CFS5 51	ABAM/RHAL/XETE	73	282	106	262
CFS5 52	ABAM/RHAL/CLUN	73	282	106	186
CFS5 53	ABAM/RHAL-OKAN	67	234	76	2
CFS6 52	ABAM/RHMA/BENE	76	303	158	109
CFS6 53	ABAM/RHMA/XETE	96	501	257	222
CFS6 54	ABAM/RHMA/VAAL/COCA	95	361	121	236
		86	296	141	257 Series Mean

Series: Mountain hemlock (TSME)

		SI	GBA	FT ³	Herbage
CMS1	11	82	142	58	10
CMS1	14	70	465	163	235
CMS1	31	70	260	75	80
CMS2	10	89	246	108	507
CMS2	16	71	351	123	309
CMS2	21	110	211	99	350
CMS2	23	89	245	113	678
CMS2	31	70	260	75	80
		81	274	102	280
		Series Mean			

Series: Shasta red fir (ABMAS)

CRG1	11	111	288	178	100
CRS1	11	62	96	30	20
CRS1	12	80	215	100	30
CRS3	11	111	274	165	125
		91	218	118	69
		77	242	103	157
		Series Mean			
		Formation Mean			

Formation: IB3b--Montane cold-deciduous forest

Series: Quaking aspen (POTR)

HQG1	11	84	189	73	1212
HQM1	21	85	168	57	1558
HQM4	11	114	232	106	1500
HQS2	11	60	120	48	21
HQS2	21	98	216	85	506
		88	185	74	959
		Formation Mean			

Formation: IIA2a--Evergreen needle-leaved woodland, rounded crowns

Series: Douglas-fir (PSME)

CDS3	11	65	71	25	250
		Series Mean			

Series: Ponderosa pine (PIPO)

s: Ponderosa pine (PIPO)		SI	GBA	FT³	Herbage
CPG1 12	PIPO/FEID-BLUES	61	52	19	339
CPM1 11	PIPO/ELGL	74	65	30	1009
CPS1 11	PIPO/PUTR-ARTR/FEID	65	59	26	217
CPS2 12	PIPO/PUTR/STOC-PUM	80	70	39	27
CPS2 13	PIPO/PUTR-ARPA/STOC	76	62	33	28
CPS2 14	PIPO/PUTR-ARPA/CAPE	82	42	23	50
CPS2 15	PIPO/PUTR/CAPE-PUM	83	65	38	51
CPS2 16	PIPO/PUTR/FEID-AGSP	72	55	28	194
CPS2 21	PIPO/PUTR/CARO	64	65	23	194
CPS3 12	PIPO/PUTR-CEVE/CAPE	83	63	36	52
		74	60	29	216 Series Mean

Series: Lodgepole pine (PICO)

CLG3	11	PICO/STOC-BASIN	62	44	20	12
CLG3	14	PICO/STOC-LUCA-PUM	70	69	35	50
CLM2	11	PICO/ARUV-PUM	79	74	42	33
CLS1	12	PICO/ARTR-RHYO	68	54	28	20
CLS2	11	PICO/PUTR/STOC-PUM	76	63	35	10
CLS2	13	PICO/PUTR/FORB-PUM	71	68	34	24
CLS2	16	PICO/PUTR-RHYO	60	72	30	10
CLS3	11	PICO/ARNE/STOC-PUM	51	36	14	10
CLS9	11	PICO/CEVE-ARPA-PUM	73	71	38	10
			68	61	31	20 Series Mean

Series: Western juniper (JUOC)

CJS2	11	JUOC/ARTR-AGSP-FEID	(40)	(40)	(8)	412 *Estimated
CJS2	12	JUOC/ARTR/FEID-AGSP-N	(45)	(45)	(10)	375
CJS2	13	JUOC/ARTR/AGSP/POSE-S	(35)	(35)	(6)	266
CJS2	31	JUOC/ARTR-HODU/AGSP	(50)	(45)	(11)	238
CJS2	32	JUOC/ARTR-CHVI/FEID	(45)	(40)	(9)	400
			(42)	(40)	(9)	338 Series Mean
			63	59	24	200 Formation Mean

Formation: IIIA1c--Broad-leaved evergreen shrubland

Series: Mountain mahogany (CELE)

SD49	CELE					366 Formation Mean
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Formation: IIIB3a--Temperate deciduous shrubland

Series: Common snowberry (SYAL)

SI GBA FT³ Herbage

SM31 11	SYAL-ROSA	55
SM31	SYAL	<u>320</u>
		187 Series Mean

Series: Mountain snowberry (SYOR)

SM32	SYOR	60 Series Mean
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Series: Thimbleberry (RUPA)

SM59 11	RUPA/POPH	250 Series Mean
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Series: Sitka alder (ALSI)

SM81 11	ALSI (ROCKY SOIL)	50 Series Mean
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Series: Vine maple (ACCI)

SM81 12	ACCI (ROCKY SOIL)	50
NTS1 11	ACCI (TALLUS)	<u>10</u>
		30 Series Mean

Series: Ninebark (PHMA)

SM19	PHMA	195 Series Mean
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Series: Douglas spiraea (SPDO)

SW41 22	SPDO-VAUL/CAREX (HYDRIC)	400
SW41 23	spiraea-SALIX/CAREX	<u>800</u>
		600 Series Mean

Series: Mountain alder (ALIN)

SW22 11	ALIN-SYAL	839
SW22 12	ALIN-SPDO	450
SW22 13	ALIN-SPRING	1633
SW29 11	ALIN	<u>1050</u>
		993 Series Mean

Series: Wetland willow (Salix-wet)

		SI	GBA	FT ³	Herbage
SW11 11	SALIX/POPR				1500
SW11 12	SALIX/CALA3				1175
SW11 13	SALIX/CAEQ				1805
SW11 14	SALIX/CAAQ				1900
SW11 15	SALIX/CAS13				2378
SW11 16	SALIX/CARO2				<u>2233</u>
					1832 Series Mean

Series: Bog huckleberry (VAOC2)

SW41 11	VAOC2/CAS13				1333
SW41 12	VAOC2/ELPA2				900
SW41 21	VACCI-SPDO/GRASS				<u>350</u>
					861 Series Mean
					<u>506</u> Formation Mean

Formation: IIIB3b--Subalpine deciduous shrubland**Series: Mountain heath (PHEM)**

SS19 11	PHEM				<u>282</u> Formation Mean
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Formation: VB1e--Medium-tall grassland, evergreen trees, semideciduous shrubs**Series: Western juniper (JUOC)**

CJG1 11	JUOC/AGSP-FEID				363
CJS1 11	JUOC/ARAR/AGSP-FEID				411
CJS1 12	JUOC/ARAR/FEID				350
CJS2 26	JUOC/ARTR/AGSP-FLAT				400
CJS2 91	JUOC/CHVI-ARTR/AGCR				529
CJS2 92	JUOC/CHVI-ARTR/AGIN				363
CJS3 11	JUOC/PUTR/AGSP-FEID				240
CJSB 11	JUOC/ARTR/FEID-AGSP-MOUND				<u>388</u>
					380 Series Mean

Series: Ponderosa pine (PIPO)

CPG1 11	PIPO/AGSP-BLUES	57	27	10	429 Series Mean
					<u>404</u> Formation Mean

Formation: VB2c--Medium-tall grassland with broad-leaved deciduous shrubs

Series: Nettleafed hackberry (CERE2)

SI GBA FT³ Herbage

SD56 11 CERE2/AGSP

150 Series Mean

Series: Smooth sumac (RHGL)

SD61 21 RHGL/AGSP

360 Series Mean

Series: Syringa (PHLE2)

NTS1 11 PHLE2-TALUS

10 Series Mean

173 Formation
Mean

Formation: VB2b--Medium-tall grassland, semideciduous shrubs

Series: Low sagebrush (ARAR)

SD19 11 ARAR/AGSP-FEID

411

SD19 12 ARAR/FEID/POSA3

179

SD19 13 ARAR/FEID/SIHY

245

278 Series Mean

Series: Blg sagebrush (ARTR)

SD21 21 ARTR/AGSP

403

SD23 11 ARTR/ARCA/POCU

1200

SD29 11 ARTR/AGSP/FEID

412

SD29 12 ARTR/FEID-AGSP

244

SD29 13 ARTR-PUTR/FEID-AGSP

200

SD29 15 ARTRV/CAGE

350

SD29 16 ARTRV-PUTR/FEID

425

SD29 17 ARTRV-SYOR

873

513 Series Mean

Series: Bitterbrush (PUTR)

SD31 11 PUTR/FEID

520

SD31 12 PUTR/AGSP

535

SD39 PUTR

375

476 Series Mean

Series: Squaw apple (PERA3)

SD30 PERA3-SYOR

220 Series Mean

Series: Spiny greenbush (GLNE)**SI GBA FT³ Herbage**

SD65 GLNE/AGSP

290 Series Mean
359 Formation
Mean**Formation: VB4a--Medium-tall grassland mainly sod grasses****Series: Blue wildrye (ELGL)**

GM41 21 ELGL-BROMUS

1400 Series Mean
1400 Formation
Mean**Formation: VB4b--Medium-tall grassland, mainly bunchgrasses****Series: Bluebunch wheatgrass (AGSP)**

GB19 11	AGSP-SPCR-ARL03	655
GB41 11	AGSP/ERHE	420
GB41 12	AGSP/POSA3/SCAN	385
GB41 13	AGSP/POSA3-BASALT	685
GB41 14	AGSP/POSA3/ASCU4	420
GB41 15	AGSP/POSA3/ERPU	665
GB41 16	AGSP/POSA3-GRANITE	550
GB41 17	AGSP/POSA3/PHCO2	860
GB41 18	AGSP/POSA3/OPPO	380
GB41 21	AGSP/POSA3	856
GB41 22	AGSP-FEID	787
GB49 11	AGSP/POSA3-SHAL/GENT	363
GB49 12	AGSP-FEID-DEEP/GENT	679
GB49 13	AGSP/POSA3-SHAL/STEEP	300
GB49 14	AGSP-FEID-DEEP/STEEP	<u>434</u>

562 Series Mean

Series: Sand dropseed (SPCR)

GB11 21	SPCR/POSA3	1025
GB12 11	SPCR-TERRACE	<u>690</u>

857 Series Mean

Series: Basin wildrye (ELCI)

GB71 11 ELCI

2400 Series Mean

Series: Idaho fescue (FEID)

		SI	GBA	FT ³	Herbage
GB51 21	FEID-SYAL-AGSP				760
GB59 11	FEID/KOCR-RIDGE				1080
GB59 12	FEID/KOCR-MOUND				1430
GB59 13	FEID/KOCR-HIGH				850
GB59 14	FEID/KOCR-LOW				990
GB59 15	FEID-AGSP-RIDGE				360
GB59 16	FEID-AGSP/LUSE				805
GB59 17	FEID-AGSP/BASA				675
GB59 18	FEID-AGSP/PHCO2				670
GB59 19	FEID-SYAL/KOCR				630
GB59 20	FEID/DAIN-CAREX				520
GB59 21	FEID-CAHO				670
GB59 22	FEID-CAREX				690
					<hr/> 791 Series Mean

Series: Green fescue (FEVI)

GS11 11	FEVI-CAHO				960
GS11 12	FEVI/LULA2				900
					<hr/> 930 Series Mean
					<hr/> 1108 Formation Mean

Formation: VC1e--Short grassland, evergreen trees, semideciduous shrubs

Series: Whitebark pine (PIAL)

CAG1 11	ABLA/PIAL/CAGE				273
CAG1 12	PIAL/CARU				250
					<hr/> 262 Series Mean

Series: Western Juniper (JUOC)

CJS8 11	JUOC/ARRI/POSA3				207 Series Mean
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Series: Ponderosa pine (PIPO)

CPS1 12	PIPO/PUTR-ARTR/SIHY	69	36	17	31 Series Mean
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Series: Lodgepole pine (PICO)

CLG4 13	PICO/CAPE-STOC-BASIN	61	32	13	12 Series Mean
					<hr/> 65 34 15 128 Formation Mean

Formation: VC2b--Short grassland, semideciduous shrubs

Series: Blg sagebrush (ARTR)

SI GBA FT³ Herbage

SD21 23	ARTR/STCO	213
SD29 14	ARTR/STOC-RHYO	<u>40</u>
		126 Series Mean

Series: Bitterbrush (PUTR)

SD33 11	PUTR/STOC-PUM	112 Series Mean
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Series: Rigld sagebrush (ARRI)

SD91 11	ARRI/POSA3-SCAB	207
SD91 31	ARRI/POSA3-LOMA	<u>225</u>
		215 Series Mean

Series: Low sagebrush (ARAR)

SD91 11	ARAR/POSA3-HAST	150
SD92 12	ARAR/POSA3-DAUN	125
SS49 21	ARAR/FERU	<u>115</u>
		130 Series Mean

Series: Alpine big sagebrush (ARTRV)

SS49 11	ARTRV/CAGE	383 Series Mean
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Series: Buckwheat (ERUM)

FM91 11	ERDO/POSA3	315
FM91 12	ERST2/POSA3	118
FM91 13	ERUM-RIDGE	40
SD93 23	ERUM/STIPA-PUM	10
SD93 22	ERMI-PHOR	<u>26</u>
		102 Series Mean
		<u>178</u> Formation Mean

Formation: VC5a--Short grassland, mainly sodgrasses

Series: Subalpine elk sedge (CAGE-S)

GS39 11	CAGE-ALPINE	<u>391</u> Formation Mean
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Formation: VC5b--Short grassland, mainly bunchgrasses

Series: Sandberg's bluegrass (POSA3)

	SI	GBA	FT ³	Herbage
GB91 11		POSA3-DAUN		160
GB99		POSA3-FEMI		<u>70</u>
				115 Series Mean

Series: Subalpine Idaho fescue (FEID-S)

GS12 11		FEID-ALPINE		254 Series Mean
				<u>184</u> Formation Mean

Formation: VC6a--Mesophytic grasslands, mainly sodgrasses (meadows)

Series: Nebraska sedge (CANE)

MM29 12		CANE		2222
MM39 11		CAREX-CABI		2100
MW19 11		CANE-JUBA		<u>3000</u>
				2441 Series Mean

Series: Tufted hairgrass (DECA)

MM19		DECA-JUBA		1947
MM19 11		DECA-CANE		2000
MM19 12		DECA		1362
MM19 21		DECA-MOIST CAREX		1060
MM19 22		DECA-WET CAREX		<u>1640</u>
				1602 Series Mean

Series: Kentucky bluegrass (POPR)

MD31 11		POPR-DRY MEADOW		1400
MD31 12		POPR-RIDGE		1100
MM90		POPR-CABU		<u>2009</u>
				1503 Series Mean

Series: Cusick's bluegrass (POCU)

MD19 11		POCU-DRY MEADOW		1333 Series Mean
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Series: Slender bog sedge (CALA4)

MW29 11		CALA4		1750 Series Mean
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Series: Woolly sedge (CALA3)

MM29 11		CALA3		2040 Series Mean
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Series: WldefruIt sedge (CAEU)	SI	GBA	FT ³	Herbage
MM29 13 CAEU				2038 Series Mean
Series: AquatlC sedge (CAAQ)				
MM29 14 CAAQ				2930 Series Mean
Series: Shortbeaked sedge (CASI2)				
MM29 15 CASI2				1750 Series Mean
Series: Few-flowered spIkerush (ELPA2)				
MW49 11 ELPA2				698 Series Mean
Series: CreepIng splkerush (ELPA)				
MW49 12 ELPA				1571 Series Mean
Series: Smallfruited bulrush (SCMI)				
MW19 21 SCMI (CAAM)				1989
MT19 11 CAREX-SCIRPUS (HYDRIC)				<u>2250</u>
				2120 Series Mean
Series: SlItka Sedge (CASI3)				
MW19 22 CASI3				2722 Series Mean
Series: Inflated sedge (CAVE)				
MW19 23 CAVE				2238 Series Mean
Series: Beaked sedge (CARO2)				
MW19 24 CARO2				2081 Series Mean
				<u>2003</u> Formation
				Mean

Formation: VC6b--Subalpine meadows

Series: Black alpine sedge (CANI2)				
MS21 11 CANI2				1130 Series Mean
Series: Holm's sedge (CASC5)				
MS21 12 CASC5-CANI2-DECA				433
MS31 11 CASC5				<u>1625</u>
				1029 Series Mean

Series: Brewer's sedge (CABR)

MS11 11 CABR

SI

GBA FT³**Herbage**688 Series Mean
949 Formation
Mean**Formation: VD2a--Perennial flowering forbs****Series: Subalpine fleecflower (POPH)**

FS59 11 POPH-ALPINE

200 Series Mean

Series: Cusick's camas (CACU)

FW39 11 CACU-SEEP

1020 Series Mean

Series: Wallowa lewisia (LECO)

FX41 11 LECOW-RIM

25 Series Mean

Series: Queen's cup beadlily (CLUN)

FW41 11 CLUN (ALIN)

528 Series Mean

Series: Arrowleaf groundsel (SETR)

FW42 11 SETR

586 Series Mean

Series: Beargrass (XETE)

FW29 11 XETE-FERU

875 Series Mean

Series: Vetch (VISA)

FM30 11 VISA-ERPE-ELGL

1200 Series Mean

Series: False hellebore (VERAT)

FW51 11 VERAT-HELA

2400 Series Mean

Series: Eriophyllum (ERIOP)

FW99 11 ERLA-PHHE

150 Series Mean
776 Formation
Mean

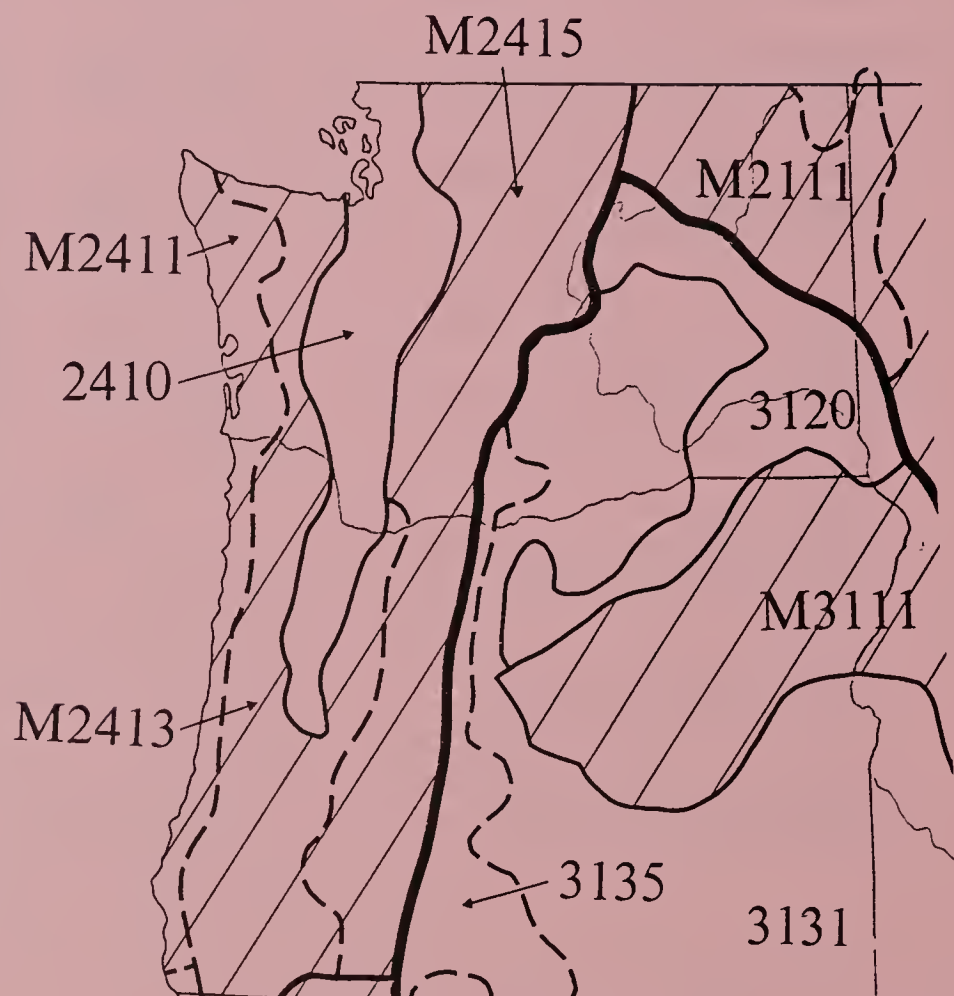
Comparison of Series Occurring in More Than One Formation

Series	Formation	Description	SI	GBA	FT ³	Herbage
ABAM	IA9a	Giant conifer forest	128	429	288	445
	IA9c	Closed conifer, conical crowns	86	296	141	257
PSME	IA9a	Giant conifer forest	130	309	179	158
	IA9b	Closed conifer, rounded crowns	83	176	71	155
	IIA2a	Conifer woodland	65	71	25	250
ABGR	IA9a	Giant conifer forest	128	414	246	246
	IA9b	Closed conifer, rounded crowns	89	278	104	109
TSHE	IA9a	Giant conifer forest	137	458	248	758
	IA9b	Closed conifer, rounded crowns	100	369	169	313
ABCO	IA9a	Giant conifer forest	122	211	132	75
	IA9b	Closed conifer, rounded crowns	88	157	88	135
PICO	IA9b	Closed conifer, rounded crowns	75	124	52	409
	IIA2a	Conifer woodland	68	61	31	20
	VC1e	Short grassland with conifers	61	32	13	12
PIPO	IA9b	Closed conifer, rounded crowns	78	94	45	250
	IIA2a	Conifer woodland	74	60	29	216
	VB1e	Medium-tall grassland with conifers	57	27	10	429
	VC1e	Short grassland with conifers	69	36	17	31
JUOC	IIA2a	Conifer woodland	42	40	9	338
	VB1e	Medium-tall grassland with conifers				380
	VC1e	Short grassland with conifers				207
ARAR	VB2b	Medium-tall grassland with shrubs				278
	VC2b	Short grassland with shrubs				130
ARTR	VB2b	Medium-tall grassland with shrubs				513
	VC2b	Short grassland with shrubs				126

Characterization of Bailey's Ecoregions

Oregon and Washington

M2111	Douglas-fir forest
M2411	Sitka spruce-cedar-hemlock forest
M2413	Cedar-hemlock-Douglas-fir forest
M2415	Silver fir-Douglas-fir forest
M3111	Grand fir-Douglas-fir forest
2410	Willamette-Puget forest
3120	Palouse grassland
3131	Sagebrush-wheatgrass
3135	Ponderosa pine-shrub forest



The following ecoregions have been sampled partially to completely by the Ecology Program of the USDA Forest Service. Ecoregions 3135 and M3111 in Oregon have been completely sampled. Ecoregion M2111 has been sampled for forested plant associations. The remaining will not be completely sampled because only part are under National Forest administration.

Herbage production is based on all data and is an average of the formations. Tree productivity is an average of those series capable of growing trees.

ECOREGION SUMMARY

		SI	GBA	FT ³	Herbage
M2111	Douglas-fir	68	194	76	289
M2411	Sitka spruce-cedar-hemlock	127	521	269	905
M2413	Cedar-hemlock-Douglas-fir	117	337	168	966
M2415	Silver fir-Douglas-fir	107	341	205	855
M3111	Grand fir-Douglas-fir	60	105	35	409
3135	Ponderosa shrub forest	86	127	65	333

ECOREGION BY FORMATION AND SERIES

M2111 Douglas-fir		<u>68</u>	<u>194</u>	<u>76</u>	<u>289</u>
IA9b		<u>84</u>	<u>331</u>	<u>111</u>	<u>74</u>
	Grand fir	84	278	93	54
	Douglas-fir	78	173	69	87
	Western red cedar	84	444	148	99
	Western hemlock	91	431	135	53
IA9c		<u>68</u>	<u>219</u>	<u>100</u>	<u>216</u>
	Subalpine fir	72	195	79	118
	Engelmann spruce	64	244	122	315
IB3b	Quaking aspen	<u>54</u>	<u>154</u>	<u>68</u>	<u>616</u>
IIA2a	Douglas-fir	<u>65</u>	<u>71</u>	<u>25</u>	<u>250</u>
M2411 Sitka spruce-cedar-hemlock		<u>127</u>	<u>521</u>	<u>269</u>	<u>905</u>
IA9a		<u>145</u>	<u>599</u>	<u>345</u>	<u>1261</u>
	Sitka spruce	168	697	464	1208
	Western hemlock	122	502	245	1315
IA9b	Western hemlock	<u>109</u>	<u>443</u>	<u>193</u>	<u>550</u>

		SI	GBA	FT ³	Herbage
M2413 Cedear-hemlock-Douglas-fir		<u>117</u>	<u>337</u>	<u>168</u>	<u>966</u>
IA9a		<u>134</u>	<u>393</u>	<u>219</u>	<u>364</u>
	Douglas-fir	130	309	179	158
	Western hemlock	141	438	250	634
	Grand fir	132	433	229	301
IA9b		<u>100</u>	<u>281</u>	<u>117</u>	<u>292</u>
	Douglas-fir	110	300	139	65
	Western hemlock	104	330	140	450
	Grand fir	86	213	73	360
IIIB3a					<u>256</u>
	Thimbleberry				250
	Sitka alder				50
	Vine maple				30
	Douglas' spiraea				600
	Bog huckleberry				350
VB4a	Blue wildrye				<u>1400</u>
VC6a					<u>2175</u>
	Sedge				2100
	Bulrush				2250
VD2a					<u>1250</u>
	Vetch				1200
	False hellebore				2400
	Eriophyllum				150
M2415 Silver fir--Douglas-fir		<u>107</u>	<u>341</u>	<u>205</u>	<u>855</u>
IA9a	Silver fir	<u>128</u>	<u>429</u>	<u>288</u>	<u>455</u>
IA9c		<u>87</u>	<u>253</u>	<u>123</u>	<u>245</u>
	Silver fir	86	296	141	257
	Shasta red fir	91	218	118	69
	Mountain hemlock	85	245	111	348
IIIB3a					<u>256</u>
	Bog huckleberry				350
	Sitka alder				50
	Vine maple				30
	Douglas' spiraea				600
VC6a					<u>2175</u>
	Bulrush				2250
	Sedge				2100

		SI	GBA	FT ³	Herbage
VD2a					<u>1156</u>
	Beargrass				875
	Vetch				1200
	False hellebore				2400
	Eriophyllum				150
M3111 Grand fir-Douglas-fir		<u>60</u>	<u>105</u>	<u>35</u>	<u>409</u>
1A9b		<u>75</u>	<u>133</u>	<u>53</u>	<u>242</u>
	Douglas-fir	79	147	53	283
	Grand fir	86	202	91	204
	Lodgepole pine	61	100	38	197
	Ponderosa pine	76	82	29	285
IA9c		<u>71</u>	<u>210</u>	<u>66</u>	<u>100</u>
	Subalpine fir	72	161	57	120
	Mountain hemlock	70	260	75	80
IIA2a		<u>53</u>	<u>50</u>	<u>15</u>	<u>463</u>
	Ponderosa pine	66	61	24	514
	Western juniper	40	40	08	412
IIIA1c	Mountain mahogany				<u>366</u>
IIIB3a					<u>147</u>
	Ninebark				195
	Common snowberry				187
	Mountain snowberry				60
VB1e		<u>43</u>	<u>28</u>	<u>06</u>	<u>408</u>
	Western juniper	30	30	04	387
	Ponderosa pine	57	27	10	429
VB2c					<u>173</u>
	Netleaf hackberry				150
	Smooth sumac				360
	Syringa				10
VB2b					<u>393</u>
	Big sagebrush				412
	Low sagebrush				411
	Mountain big sagebrush				549
	Bitterbrush				476
	Squaw apple				220
	Spiny greenbush				290

		SI	GBA	FT ³	Herbage
VB4b					<u>785</u>
	Bluebunch wheatgrass				562
	Sand dropseed				857
	Idaho fescue				791
	Basin wildrye				2400
	Green fescue				930
VC1e					<u>235</u>
	Western juniper				207
	Whitebark pine				262
VC2b					<u>231</u>
	Rigid sagebrush				207
	Subalpine sagebrush				383
	Buckwheat				102
VC5a	Subalpine elk sedge				<u>391</u>
VC5b					<u>207</u>
	Sandberg's bluegrass				160
	Subalpine Idaho fescue				254
VC6a					<u>1583</u>
	Tufted hairgrass				1350
	Kentucky bluegrass				1200
	Nebraska sedge				2200
VD2a					<u>415</u>
	Cusick's camas				1020
	Wallowa lewisia				25
	Subalpine fleecflower				200
3135 Ponderosa shrub		<u>86</u>	<u>127</u>	<u>65</u>	<u>333</u>
IA9a		<u>123</u>	<u>214</u>	<u>141</u>	<u>43</u>
	Douglas-fir	123	217	150	10
	White fir	122	211	132	75
IA9b		<u>81</u>	<u>127</u>	<u>64</u>	<u>265</u>
	Ponderosa pine	79	100	51	250
	White fir	88	157	88	135
	Lodgepole pine	75	124	52	409
IB3b	Quaking aspen	<u>99</u>	<u>205</u>	<u>83</u>	<u>1188</u>

		SI	GBA	FT ³	Herbage
IIA2a		63	56	25	148
	Ponderosa pine	77	66	35	87
	Lodgepole pine	68	61	31	20
	Western juniper	43	40	09	338
IIIB3a					<u>1229</u>
	Mountain alder				993
	Wetland willow				1832
	Bog huckleberry				861
IIIB3b	Mountain heath				<u>282</u>
VB1e		65	32	13	22
	Ponderosa pine	69	36	17	31
	Lodgepole pine	61	32	13	12
VB2b					<u>217</u>
	Low sagebrush				212
	Big sagebrush				222
VC2b					<u>102</u>
	Big sagebrush				126
	Bitterbrush				112
	Rigid sagebrush				225
	Low sagebrush				130
	Buckwheat				26
VC6a					<u>1924</u>
	Nebraska sedge				2222
	Tufted hairgrass				1362
	Kentucky bluegrass				2009
	Cusick's bluegrass				1333
	Slender bog sedge				1750
	Woolly sedge				2040
	Widefruit sedge				2038
	Aquatic sedge				2930
	Shortbeaked sedge				1750
	Few-flowered spikerush				698
	Creeping spikerush				1571
	Smallfruited bulrush				2120
	Sitka sedge				2722
	Inflated sedge				2238
	Beaked sedge				2081
VC6b					<u>949</u>
	Black alpine sedge				1130
	Holm's sedge				1029
	Brewer's sedge				688

VD2a

Queen's cup beadlely
Arrowleaf groundsel

557
528
586

Characteristics of Formations

By Ecoregion

Oregon and Washington

Formation	Ecoregion	Name	SI	GBA	FT ³	Herbage
IA9a Glant conifer forest						
	2411	Sitka spruce-cedar-hemlock	127	521	269	1115
	2413	Cedar-hemlock-Douglas-fir	134	393	219	364
	2415	Silver fir-Douglas-fir	128	429	288	445
	3135	Ponderosa shrub	123	214	141	43
IA9b Closed conifer, rounded crowns						
	2111	Douglas-fir	84	333	111	74
	2411	Sitka spruce-cedar-hemlock	109	443	193	550
	2413	Cedar-hemlock-Douglas-fir	100	281	117	292
	3111	Grand fir-Douglas-fir	75	133	53	242
	3135	Ponderosa shrub	81	127	64	265
IA9c Closed conifer, conical crowns						
	2111	Douglas-fir	68	219	100	216
	2415	Silver fir-Douglas-fir	87	253	123	245
	3111	Grand fir-Douglas-fir	71	210	66	100
IIA2a Conifer woodland, rounded crowns						
	2111	Douglas-fir	65	71	25	250
	3111	Grand fir-Douglas-fir	53	50	15	463
	3135	Ponderosa shrub	63	56	25	148
IIIB3a Temperate, deciduous shrubland						
	2413	Cedar-hemlock-Douglas-fir				256
	2415	Silver fir-Douglas-fir				256
	3111	Grand fir-Douglas-fir				147
	3135	Ponderosa shrub				1229
VB1e Medium-tall grassland, conifers						
	3111	Grand fir-Douglas-fir	43	28	6	408
	3135	Ponderosa shrub	65	32	13	22

		SI	GBA	FT ³	Herbage
VC2b Short grasslands, semideciduous shrubs					
	3111	Grand fir-Douglas-fir			393
	3135	Ponderosa shrub			102
VC6a Mesophytic grasslands (meadows)					
	2413	Cedar-hemlock-Douglas-fir			2175
	2415	Silver fir-Douglas-fir			2175
	3111	Grand fir-Douglas-fir			1583
	3135	Ponderosa shrub			1924
VD2a Perennial flowering forbs					
	2413	Cedar-hemlock-Douglas-fir			1250
	2415	Silver fir-Douglas-fir			1156
	3111	Grand fir-Douglas-fir			415
	3135	Ponderosa shrub			557

APPENDIX 4

Potential Natural Vegetation (Kuchler Types)*

*Kuchler, A.W. 1964. Manual to accompany the map potential natural vegetation of the Conterminous United States, Amer. Geographical Soc., Special Pub. No. 36 (152p) (2nd ed. Rev. map 1975) N.Y.

*U.S. Department of the Interior, Geological Survey 1969, sheet number 90, (one map), Washington, D.C.

The kinds of potential natural vegetation on the 1969 map are different from those on the 1964 map. These differences are shown under "1969" and "1964" on the following pages.

Potential Natural Vegetation in the Pacific Northwest

Map dated
1969 1964

K1 K1 SPRUCE-CEDAR-HEMLOCK FOREST (*PICEA-THUJA-TSUGA*)

Physiognomy: Dense forest of tall needle-leaf evergreen trees, rarely with an admixture of broad-leaf deciduous trees.

Dominants: Sitka spruce (*Picea sitchensis*)
Western red cedar (*Thuja plicata*)
Western hemlock (*Tsuga heterophylla*)

Other components: *Abies grandis*, *Alnus rubra*, *Chamaecyparis lawsoniana* (southern part), *Pseudotsuga menziesii*

Occurrence: Along the coasts of Washington, Oregon, and British Columbia; occasionally on the western slopes of the Cascade Range

K2 K2 CEDAR-HEMLOCK-DOUGLAS FIR FOREST (*THUJA-TSUGA-PSEUDOTSUGA*)

Physiognomy: Dense forests of very tall needle-leaf evergreen trees

Dominants: Douglas-fir (*Pseudotsuga menziesii*)
Western red cedar (*Thuja plicata*)
Western hemlock (*Tsuga heterophylla*)

Other components: *Abies grandis*, *Acer circinatum*, *A. macrophyllum*, *Berberis nervosa*, *Gaultheria shallon*, *Rubus spectabilis*; in southernmost part only: *Pinus lambertiana*, *P. ponderosa*

Occurrence: Pacific Northwest from the Canadian border into California, mostly west of the crest of the Cascade Range

Map dated
1969 1964

K3 K3 SILVER FIR-DOUGLAS-FIR FOREST (*ABIES-PSEUDOTSUGA*)

Physiognomy: Dense forests of tall needle-leaf evergreen trees
 with patches of shrubby undergrowth

Dominants: Pacific silver fir (*Abies amabilis*)
 Douglas-fir (*Pseudotsuga menziesii*)

Other
components: *Abies grandis*, *A. procera*, *Acer circinatum*, *Arctosta-*
 phylos nevadensis, *Pachystima myrsinites*,
 Rhododendron macrophyllum, *Thuja plicata*,
 Vaccinium membranaceum

Occurrence: Western slopes of Cascade Range, Olympic Mountains

K4 K4 FIR-HEMLOCK FOREST (*ABIES-TSUGA*)

Physiognomy: Dense or medium-dense forests of low to medium tall
 needle-leaf evergreen trees

Dominants: Subalpine fir (*Abies lasiocarpa*)
 Mountain hemlock (*Tsuga mertensiana*)

Other
components: *Abies amabilis*, *Picea engelmannii*, *Pinus albi-*
 caulis, *P. contorta*, *P. monticola*, *Pseudotsuga*
 menziesii, *Vaccinium spp.*, *Xerophyllum tenax*

Occurrence: Cascade Range, Olympic Mountains

Map dated
1969 1964

K5 K5 MIXED CONIFER FOREST (*ABIES-PINUS-PSEUDOTSUGA*)

- Physiognomy: Tall, needle-leaf evergreen forest, occasionally with broadleaf trees and shrubs
- Dominants: White fir (*Abies concolor*)
Incense cedar (*Calocedrus decurrens*)
Sugar pine (*Pinus lambertiana*)
Ponderosa pine (*Pinus ponderosa*)
Douglas-fir (*Pseudotsuga menziesii*)
- Other
components: *Arctostaphylos mariposa*, *A. patula*, *Ceanothus integerrimus*, *Chamaebatia foliolosa*, *Pseudotsuga macrocarpa* (southern part only, where it may dominate), *Quercus chrysolepis*, *Q. kelloggii*, *Ribes nevadense*, *R. roezlii*, *Rubus parviflorus*
- Occurrence: Sierra Nevada, northern California Coast Range extending into southwestern Oregon; high elevations of southern California

K6 K6 REDWOOD FOREST (*SEQUOIA-PSEUDOTSUGA*)

- Physiognomy: Dense forests of very tall needle-leaf evergreen trees, sometimes with much undergrowth
- Dominants: Douglas-fir (*Pseudotsuga menziesii*)
Redwood (*Sequoia sempervirens*)
- Other
components: *Abies grandis*, *Gaultheria shallon*, *Lithocarpus densiflorus*, *Myrica californica*, *Oxalis oregana*, *Polystichum munitum*, *Rhododendron macrophyllum*, *Tsuga heterophylla*, *Vaccinium ovatum*, *Vancouveria parviflora*, *Whipplea modesta*
- Occurrence: Seaward slopes of outer Coast Ranges of northern California and adjacent Oregon

Map dated
1969 1964

K7 K7 RED FIR FOREST (*ABIES*)

- Physiognomy: Tall dense forests of needle-leaf evergreen trees with patches of shrubby undergrowth
- Dominants: Red fir (*Abies magnifica shastensis*)
- Other components: *Castanopsis sempervirens*, *Ceanothus cordulatus*, *Ipomopsis aggregata*, *Pinus contorta*, *P. jeffrey*, *P. monticola*, *Populus tremuloides*
- Occurrence: Sierra Nevada of California, southern Oregon Cascades

K10 K10 PONDEROSA SHRUB FOREST (*PINUS*)

- Physiognomy: Moderately dense to open forests of tall needle-leaf evergreen trees with shrubs and some grass
- Dominants: Ponderosa pine (*Pinus ponderosa*)
- Other components: *Agropyron spicatum*, *Arctostaphylos patula*, *A. parryana* var. *pinetorum*, *Calamagrostis rubescens*, *Ceanothus velutinus*, *Cercocarpus ledifolius*, *Festuca idahoensis*, *Holodiscus discolor*, *Physocarpus capitatus*, *Pseudotsuga menziesii*, *Purshia tridentata*, *Symphoricarpos* spp.
- Occurrence: Oregon, northern California

K10 K11 WESTERN PONDEROSA FOREST (*PINUS*)

- Physiognomy: Moderately dense to open forests of tall needle-leaf evergreen trees with shrubs and some grass
- Dominants: Ponderosa pine (*Pinus ponderosa*)
- Other components: *Achillea millefolium*, *Agropyron spicatum*, *Arctostaphylos nevadensis* (southern part), *A. uva-ursi*, *Carex geyeri*, *Festuca idahoensis*, *Hieracium* spp., *Lupinus* spp., *Poa sandbergii*, *Purshia tridentata*, *Symphoricarpos albus* (northern part), *Calamagrostis rubescens*
- Occurrence: Northern Rocky Mountains, Washington and Oregon.

Map dated
1969 1964

K11 K12 DOUGLAS-FIR FOREST (*PSEUDOTSUGA*)

- Physiognomy: Medium dense forest of medium tall needle-leaf
 evergreen trees
- Dominants: Douglas-fir (*Pseudotsuga menziesii*)
- Other
components: *Abies concolor*, *Larix occidentalis*, *Physocarpus*
 malvaceus, *Picea pungens*, *P. glauca* (northern part),
 Pinus contorta, *P. ponderosa* (lower elevations),
 Populus tremuloides
- Occurrence: Northern Rocky Mountains, Washington and Oregon

K12 K13 CEDAR-HEMLOCK-PINE FOREST (*THUJA-TSUGA-PINUS*)

- Physiognomy: Tall evergreen needle-leaf forest, often very dense
- Dominants: Western white pine (*Pinus monticola*)
 Western red cedar (*Thuja plicata*)
 Western hemlock (*Tsuga heterophylla*)
- Other
components: *Abies grandis*, *Larix occidentalis*, *Pinus ponderosa*
 (lower elevations), *Pseudotsuga menziesii*
- Occurrence: Northern Rocky Mountains

K13 K14 GRAND FIR-DOUGLAS FIR FOREST (*ABIES-PSEUDOTSUGA*)

- Physiognomy: Tall, needle-leaf evergreen forest
- Dominants: Grand fir (*Abies grandis*)
 Douglas-fir (*Pseudotsuga menziesii*)
- Other
components: *Larix occidentalis*, *Pinus monticola*, *Populus tremu-*
 loides
- Occurrence: Idaho, eastern Oregon and Washington

Map dated
1969 1964

K14 K15 WESTERN SPRUCE-FIR FOREST (*PICEA-ABIES*)

Physiognomy: Dense to open forests of low to medium-tall needle-leaf evergreen trees; open forests with a synusia of shrubs and herbaceous plants

Dominants: Subalpine fir (*Abies lasiocarpa*)
Engelmann spruce (*Picea engelmannii*)

Other
components: *Arctostaphylos uva-ursi*, *Arnica cordifolia*,
Calamagrostis canadensis, *Carex* spp., *Larix*
lyallii, *Menziesia ferruginea*, *Pinus albicaulis*
(northern part), *P. contorta*, *Populus tremuloides*,
Pseudotsuga menziesii (lower elevations), *Shepherdia*
canadensis, *Symphoricarpos albus*, *Tsuga mertensiana*
(western part), *Vaccinium* spp., *Xerophyllum tenax*

Occurrence: High altitudes of northern Rocky Mountains, Washington,
and Oregon

K49 K24 JUNIPER STEPPE WOODLAND (*JUNIPERUS-ARTEMISIA-AGROPYRON*)

Physiognomy: Open groves of low, often shrub-like needle-leaf evergreen trees with an open to medium-dense understory of low shrubs and grass

Dominants: Bluebunch wheatgrass (*Agropyron spicatum*)
Big sagebrush (*Artemisia tridentata*)
Western juniper (*Juniperus occidentalis*)

Other
components: *Artemisia arbuscula*, *Balsamorhiza sagittata*, *Festuca*
idahoensis, *Lithospermum ruderales*, *Lupinus sericeus*,
Poa secunda, *Purshia tridentata*, *Sitanion* spp.

Occurrence: East of Cascade Range

Map dated
1969 1964

(none) **K25 ALDER-ASH FOREST (*ALNUS-FRAXINUS*)** (over 5 m (16 ft.) tall)

Physiognomy: Usually dense forests of low to medium tall
broad-leaf deciduous trees, often with a synusia of
graminoids and forbs

Dominants: Red alder (*Alnus rubra*)
Oregon ash (*Fraxinus latifolia*)

Other
components: *Acer macrophyllum*, *Carex* spp., *Deschampsia*
caespitosa, *Juncus* spp., *Populus trichocarpa*,
Symphoricarpos albus

Occurrence: Oregon, Washington

K25 K26 OREGON OAKWOODS (*QUERCUS*) (over 5 m (16 ft.) tall)

Physiognomy: Broadleaf deciduous forests of medium tall trees,
often with an undergrowth of grass and some shrubs

Dominants: Oregon white oak (*Quercus garryana*)

Other
components: *Agrostis tenuis*, *Amelanchier* spp., *Arbutus*
menziesii (southern part), *Bromus laevipes*,
Danthonia californica, *Elymus glaucus*, *Festuca*
californica, *F. rubra*, *Melica bulbosa*, *Rhus*
diversiloba

Occurrence: Oregon and Washington

Map dated
1969 1964

K25 K29 CALIFORNIA MIXED EVERGREEN FOREST (QUERCUS-ARBUTUS-PSEUDOTSUGA)

Physiognomy: Medium tall to tall broadleaf and needleleaf evergreen forest with an admixture of broadleaf deciduous trees

Dominants: Madrone (*Arbutus menziesii*)
Golden chinquapin (*Castanopsis chrysophylla*)
Tanbark oak (*Lithocarpus densiflorus*)
Douglas-fir (*Pseudotsuga menziesii*)
Canyon live oak (*Quercus chrysolepis*)
Interior live oak (*Quercus wislizenii*)
California laurel (*Umbellularia californica*)
Oregon white oak (*Quercus garryana*)

Other components: *Acer macrophyllum*, *Aesculus californica*, *Arctostaphylos manzanita*, *Ceanothus parryi*, *C. thyrsiflorus*, *Cornus nuttallii*, *Quercus douglasii*, *Q. garryana*, *Q. kelloggii*

Occurrence: Northern California Coast Range, extending into Oregon

K29 K34 MONTANE CHAPARRAL (ARCTOSTAPHYLOS-CASTANOPSIS-CEANOTHUS)

Physiognomy: Dense vegetation of broadleaf evergreen shrubs, occasionally with some needleleaf evergreen and broadleaf deciduous trees

Dominants: Greenleaf manzanita (*Arctostaphylos patula*)
Bush chinquapin (*Castanopsis sempervirens*)
Snow bush (*Ceanothus cordulatus*)

Other components: *Abies magnifica*, *Arctostaphylos manzanita*, *A. nevadensis*, *A. viscida*, *Ceanothus velutinus*, *Pinus lambertiana*, *P. ponderosa*, *Quercus kelloggii*, *Q. vaccinifolia*

Occurrence: Northern California, southern Oregon

Map dated
1969 1964

K31 K37 MOUNTAIN MAHOGANY OAK SCRUB (*CERCOCARPUS LEDIFOLIUS*) (under 5 m
(16 ft.) tall)

Physiognomy: Dense to open vegetation of deciduous or semideciduous shrubs

Dominants: Mountain mahogany (*Cercocarpus ledifolius*)
Gambel oak (*Quercus gambelii*)

Other
components: *Acer grandidentatum*, *Amelanchier utahensis*,
Arctostaphylos spp., *Ceanothus velutinus*,
Cowania mexicana, *Fallugia paradoxa*, *Pachystima*
myrsinites, *Physocarpus malvaceus*, *Purshia*
tridentata, *Quercus havardii*, *Q. turbinella*,
Q. undulata, *Rhus trilobata*, *Symphoricarpos* spp.

Occurrence: Utah, Colorado, scattered in Nevada, N. California, E.
Oregon

K34 K40 SALTBUSH-GREASEWOOD (*ATRIPLEX-SARCOBATUS*)

Physiognomy: Open stands of low shrubs and dwarf shrubs

Dominants: Shadscale (*Atriplex confertifolia*)
Greasewood (*Sarcobatus vermiculatus*)

Other
components: *Allenrolfea occidentalis*, *Artemisia spinescens*, *Atriplex*
spp., *Distichlis spicatum*, *Eurotia lanata*,
Grayia spinosa, *Kochia americana*, *Lycium copperi*,
Menodora spinescens (western part), *Suaeda*
torreyana

Occurrence: Great Basin and eastward to Wyoming, southward to
New Mexico, west and north into Oregon and Washington

Map dated
1969 1964

K42 K49 TULE MARSHES (*SCIRPUS-TYPHA*)

- Physiognomy: Tall graminoid vegetation
- Dominants: Common tule (*Scirpus acutus*)
 California bulrush (*Scirpus californicus*)
 Olney bulrush (*Scirpus olneyi*)
 Tule (*Scirpus validus*)
 Cattail (*Typha domingensis*)
 Soft flag (*Typha latifolia*)
- Other
components: *Carex senta*, *C. obnupta*, *Eleocharis palustris*,
 Typha angustifolia.
- Occurrence: Widespread, greatest extent in the Central Valley of
 California, elsewhere, especially along shallow
 lake shores as along the northeastern banks of Great
 Salt Lake, Klamath Marsh in Oregon

K43 K50 FESCUE-WHEATGRASS (*FESTUCA-AGROPYRON*)

- Physiognomy: Dense, low to medium tall grassland
- Dominants: Bluebunch wheatgrass (*Agropyron spicatum*)
 Idaho fescue (*Festuca idahoensis*)
- Other
Components: *Achillea millefolium* var. *lanulosa*, *Artemisia*
 tripartita, *Collinsia parviflora*, *Hieracium albertinum*,
 Lupinus sericeus, *Potentilla blaschkeana*
 Rosa nutkana, *R. woodsii*, *Symphoricarpos albus*
- Occurrence: Eastern Washington, northwestern Idaho

Map dated
1969 1964

K44 K51 WHEATGRASS-BUEGRASS (AGROPYRON-POA)

- Physiognomy: Dense, low to medium tall grassland
- Dominants: Bluebunch wheatgrass (*Agropyron spicatum*)
Idaho fescue (*Festuca idahoensis*)
Sandberg bluegrass (*Poa sandbergii*)
- Other
components: *Achillea millefolium* var. *lanulosa*, *Astragalus*
spp., *Chrysothamnus nauseosus*, *Draba verna*,
Festuca pacifica, *Lithophragma bulbifera*,
Lupinus sericeus, *Plantago purshii*, *Stellaria*
nitens
- Occurrence: Washington, Oregon, northwestern Idaho

K45 K52 ALPINE MEADOWS AND BARREN (AGROSTIS, CAREX, FESTUCA, POA)

- Physiognomy: Usually short grasses and sedges, dense to very open
with extensive barren areas, many forbs
- Dominants: Bentgrass (*Agrostis spp.*)
Sedge (*Carex spp.*)
Hairgrass (*Deschampsia caespitosa*)
Woodrush (*Luzula spicata*)
Mountain timothy (*Phleum alpinum*)
Bluegrass (*Poa spp.*)
Spike trisetum (*Trisetum spicatum*)
- Other
components: *Achillea spp.*, *Antennaria spp.*, *Aquilegia spp.*,
Arenaria spp., *Castilleja spp.*, *Draba spp.*, *Erigeron*
compositus, lichen spp., *Oxyria digyna*, *Penstemon*
fruticosus, *Phacelia spp.*, *Phlox caespitosa*,
Polemonium spp., *Polygonum spp.*, *Potentilla diver-*
sifolia, *Potentilla spp.*, *Selaginella spp.*,
Sibbaldia procumbens, *Sieversia turbinata*,
Solidago spp.
- Occurrence: Rocky Mountains, Cascade Range, Sierra Nevada,
Olympics, Blue Mountains

Map dated
1969 1964

K49 K55 SAGEBRUSH STEPPE (*ARTEMISIA-AGROPYRON*)

Physiognomy: Dense to open grassland with dense to open shrub synusia

Dominants: Bluebunch wheatgrass (*Agropyron spicatum*)
Big sagebrush (*Artemisia tridentata*)

Other
components: *Artemisia arbuscula* (western part), *A. nova*
(eastern part), *Balsamorhiza sagittata*, *Festuca*
idahoensis, *Lithospermum ruderae*, *Lupinus sericeus*,
Oryzopsis hymenoides, *Phlox* spp., *Poa nevadensis*,
P. secunda, *Purshia tridentata*, *Sitanion* spp.

Occurrence: Pacific Northwest and eastward to Rocky Mountains

APPENDIX 5

Pacific Northwest Ecoclass Codes for Plant Associations

Pacific Northwest Ecoclass Codes for Plant Associations

Effective Date: November 1988

Prior revision: January 1984

This publication is **updated periodically**. Be sure you are using the current edition.

Listings are as follows:

Identifier	Description of the Identifier
CAG1 11	ABLA2-PIAL/CAGE: Subalpine fir-whitebark pine/elk sedge, R6 AG 3-1

Identifier is divided into two units:

Lifeform	Association
CAG1	11

LIFEFORM codes are alphanumeric and are composed of two sets of inFormation: "Lifeform" encompassing the first two characters and "species group" encompassing the second two characters.

First two-character codes represent the first letter of key words such as "F" for forb, "G" for grass, "S" for shrub and "C" for conifer. This code is followed by a second letter identifying the kind or nature of the forb, grass, shrub, or conifer. For example, "GB" represents "grass, bunch" or bunchgrass site potential whereas "GS" represents "grass, subalpine" or subalpine grasslands. In conifers and hardwoods, the second letter represents the species of tree; for example "CP" means conifer, ponderosa and "CH" means conifer, western hemlock.

Second two-character codes refer to species in the understory of trees and shrubs or groups of secondary species in simple plant communities like bluebunch wheatgrass. For example, CPG1 means grass understory under ponderosa pine in which the first group of grasses are of the bunch form and are dominated by wheatgrass and fescue. CPS1 means shrub understory under ponderosa pine dominated by sagebrush.

Some **second two-character** codes may contain an "X" "Y", or "Z" as the first letter (i.e., CEX1). These denote special kinds of ecological units that are limited to the National Forest cited.

A description of the ecological unit is given. For example:

"CEX1 04 MALHEUR(04) 2A: slope less than 30%; CES3 11, CES4 11"

means ecological unit CEX1 04 is limited to the Malheur National Forest, Forest number 04, forest map code 2A, designated as slopes less than 30 percent and is made up of Associations CES3 11 (Sub-Subalpine fir/big huckleberry) and CES4 11 (Sub-Subalpine fir/grouse huckleberry).

Resource Inventory in the Pacific Northwest Region uses groups of plant associations as a primary mapping stratification. Some of these groups are identified by established Life Form codes. Others have required additions to the ecoclass codes in the second two-character set. All are alpha characters. The first letter follows the descriptions already established for Conifer, Hardwood, and nonvegetated codes. The second letter indicates environmental criteria as follows: C = cool, D = dry, H = hot, M = mesic, W = wet. And at times another vegetation code is used to conform to a 4-letter or Alpha-numeric code. Examples are: SWXX = shrub wetlands, GBFX = Snake River bunchgrass-forb, and CHSC = western hemlock/rhododendron-cool sites. Each Resource Inventory ecoclass code is described.

Association codes are all numeric. They identify classified ecological units described in various published documents. The abbreviation and reference for each publication start on the next page.

Description of the Identifier is divided into three parts: (1) the technical name, (2) the common name, and 3) the reference where the association is described. The technical name uses four letters and sometimes a numeral for a species. Letters are taken from the first two letters of the Genus and the first two letters of the species, --e.g. *Poa sandbergii* is POSA. When two or more species have the same letters, a numeral follows the code to identify which species is represented. For example, several species have the letter code POSA. *Poa sandbergii* is the third species with this code so it is identified as POSA3. *Polygonum sawatchense* is POSA and *P. sachalinense* is POSA2.

A geographic locator is sometimes required when associations that are considered different are dominated by the same species. For example, the cold, floristically depauperate subalpine fir/grouse huckleberry plant community occurs in the Blue Mountains, Cascades, Okanogan uplands and Rocky Mountains. Major differences in geology, soils and climate between these locations, variation in productivity and dissimilar successional development clearly imply that "ABLA2/VASC" should be considered as several different associations. These associations are identified by a geographical epiethet: ABLA2/VASC-BLUES for the Blue Mountains, ABLA2/VASC-OKAN for the Okanogan uplands and ABLA2/VASC-DAUB for Daubenmire's North Idaho Rocky Mountains. The four-letter locator is explained in the common name identifier.

A common-name identifier follows the technical name. At times, common names cannot be easily contained in the one-line entry so some species are abbreviated. The reference which completely describes each association is cited last. For example:

CAG1 11 ABLA2-PIAL/CAGE: Subalpine fir-whitebark pine/elk sedge, R6 Ag 3-1

ABLA2 is *Abies lasiocarpa* which is co-dominant with PIAL, *Pinus albicaulis*, with an understory dominated by CAGE, *Carex geyeri*. The common name is Subalpine fir-whitebark pine/elk sedge. It is described in the publication R6 AG 3-1: Hall, F.C. 1973. Plant communities of the Blue Mountains in Eastern Oregon and southeastern Washington. USDA Forest Service, Pacific Northwest Region, R6 Area Guide 3-1, 62 pp., illus. The references cited are shown on the next page.

When a plant association appears in more than one publication, all publications containing the association are cited.

Ecoclass Citation

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Codes for Pacific Northwest Ecoclass Identification

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GS Subalpine or alpine grassland	

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NI	Ice fields, glaciers, ice caves	
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WL	Lake, pond, impoundment, non-moving water	
WO	Oceans, seas, saline water bodies	
WR	Running water - stream, river, creek, ditch	

Administrative of Agricultural

AX	Administrative or agricultural
AB	Buildings, structures, roads
ABA1	Heliport
ABA2	Runway, landing strip
ABA9	Aircraft facilities
ABC9	Campground, developed
ABP9	Parking area
ABR8	Road, boat launch area
ABS1	Rock and gravel storage area
ABS9	Open storage area
AC	Cultivated land
AD	Dump for trash, garbage, etc.
ADG9	Garbage dump
ADL9	Land fill, soil, gravel, and/or rock dump (sanitary)
ADT9	Trash dump, refuse dump
AG	Grassland, permanent pasture
AO	Orchards
AR	Recreation areas, parks, play areas, golf courses

Coniferous Forest

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CAG2	Alpine park-green fescue
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CCS3	Red cedar/pachistima-huckleberry
CCS3 11	THPL/VAME: Red cedar/big huckleberry, R6 E TP-008-88
CCS3 21	THPL/PAMY: Red cedar/pachistima, Daub '68
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CDH0	Douglas-fir with important associated hardwood
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CDH3	Douglas-fir/white oak
CDH4	Douglas-Fir/bigleaf maple
CDH5	Douglas-fir/chinkapin,canyon liveoak
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CDSD	Douglas -fir/shrub, dry, Resource Inventory
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CEC0	Subalpine fir-Engelmann spruce with associated conifers
CEC1	Subalpine fir - lodgepole pine
CEC2	Engelmann spruce-true fir
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CEM1 11	PIEN/CAEU: Engelmann spruce/widefruit sedge, R6 E TP-279-87
CEM2	Subalpine fir, Engelmann spruce forb wetlands
CEM2 11	PIEN/EQAR: Engelmann spruce/horsetail, R6 E 132-83, R6 E TP-008-88, INT-34
CEM2 21	PIEN/EQAR-STRO: Engelmann spruce/horsetail/twisted stalk, R6 E TP-279-87
CEM2 22	PIEN/CLUN: Engelmann spruce/queen's cup beadleily, R6 E TP-279-87
CEM3	Subalpine fir, Engelmann spruce short shrub wetlands
CEM3 11	PIEN/VAOC2/FORB: E. spruce/bog blueberry/forb, R6 E TP-279-87
CEM3 12	PIEN/VAOC2/CAEU: E. spruce/bog blueberry/widefruit sedge, R6 E TP-279-87
CES0	Subalpine fir-spruce with shrub dominated ground vegetation
CES1	Subalpine fir-spruce/pachistima
CES1 11	ABLA2/PAMY-OKAN: Subalpine fir/pachistima, Okanogan, R6 E 132-83
CES1 21	ABLA2/PAMY-DAUB: Subalpine fir/pachistima, Daub '68
CES1 31	ABLA2/CLUN: Subalpine fir/queen's cup beadleily, R6 E 255-86
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CES3 11	ABLA2/VAME-BLUE: Subalpine fir/big huckleberry, Blue mtns., R6 AG 3-1
CES3 12	ABLA2/VACCI: Subalpine fir/huckleberries, R6 E 132-83

CES3 13 ABLA2/VAME-COLV: Subalpine fir/big huckleberry, Colville, R6 E TP-008-88
 CES3 15 ABLA2/VAME-WALLO: Subalpine fir/big huckleberry-Wallowas, R6 E 255-86
 CES3 21 ABLA2/VAME-OLY: Subalpine fir/big huckleberry, Olympic, R6 E TP-001-88

 CES4 Subalpine fir-spruce/grouse huckleberry-pinemat manzanita; Resource Inventory
 CES4 11 ABLA2/VASC-BLUES: Subalpine fir/grouse huckleberry, Blue Mtns. R6 AG 3-1
 CES4 12 ABLA2/VASC-O&C: Subalpine fir/grouse huckleberry, Okanogan & Colville R6 E 132-83, R6 E TP-008-88
 CES4 13 ABLA2/VASC/CARU-OKAN: Subalpine fir/grouse huck/pinegrass, Okanogan, R6 E 132-83
 CES4 15 ABLA2/VASC/POPU: Subalpine fir/grouse huck/polemonium, R6 E 255-86
 CES4 21 ABLA2/VASC-DAUB: Subalpine fir/grouse huckleberry, INT-34, INT-236, Daub '68
 CES4 22 ABLA2/VACA: Subalpine fir/dwarf huckleberry, R6 E TP-008-88, INT-236, INT-34

 CES5 Subalpine fir/snowberry

 CES6 Subalpine fir-spruce/mountain heath-laboradortea
 CES6 11 ABLA2/PHEM: Subalpine fir/red mountainheath, R6 E 132-83
 CES6 21 ABLA2/JUCO4: Subalpine fir/common juniper, R6 E TP-001-88

 CES7 Subalpine fir-spruce/devil's club

 CEX1 04 Malheur (04) 2A: slope less 30%, CES3 11, CES4 11
 CEX2 04 Malheur (04) 2B: slope 30-70%, CES3 11, CES4 11

 CF Fir: silver, noble

 CFC0 Silver or noble fir with associated conifers
 CFC1 Silver fir-mtn hemlock
 CFC1 51 ABAM-TSME/XETE: Silver fir-mtn hemlock/beargrass, Dyrn '74
 CFC2 Silver fir-western hemlock
 CFC2 51 ABAM-TSHE/RHMA/GASH: Silver fir-W. hemlock/rhodo/salal, R6 E 100-82
 CFC3 Silver fir-white, grand fir
 CFC3 11 ABAM-ABGR/SMST: Silver fir-grand fir/false solomonseal, R6 E 257-86

 CFF0 Silver or noble fir with forb dominated ground vegetation
 CFF1 Silver or noble fir/oxalis-twisted stalk-tiarella-clintonia
 CFF1 11 ABAM/OXOR-OLY: Silver fir/oxalis, Olympic, R6 E TP-001-88
 CFF1 51 ABAM/CLUN: Silver fir/queen's cup beadlelily, Dyrn '74
 CFF1 52 ABAM/TIUN: Silver fir/tiarella, R6 E 100-82, R6 E 130-83
 CFF1 53 ABAM/OXOR: Silver fir/oxalis, R6 E 100-82

 CFF2 Silver or noble fir/vanillaleaf
 CFF2 11 ABAM/ACTR-TITR: Silver fir/vanillaleaf-foamflower, R6 E TP-001-88
 CFF2 51 ABPR/ACTR: Noble fir/vanillaleaf, Dyrn '74
 CFF2 52 ABAM/ACTR: Silver fir/vanillaleaf, Dyrn '74
 CFF2 53 ABAM/ACTR-CLUN: Silver fir/vanillaleaf-beadlelily, R6 E 130-83

 CFF3 Silver or noble fir/beargrass; Resouce Inventory
 CFF3 11 ABAM/XETE: Silver fir/beargrass, R6 E TP-001-88

 CFF4 Silver or noble fir/Oregon anemone, wild ginger
 CFF5 Silver or noble fir/twinflower

CFF6	Silver or noble fir/swordfern
CFF6 11	ABAM/POMU: Silver fir/swordfern, R6 E TP-001-88
CFF6 12	ABAM/POMU-OXOR: Silver fir/swordfern-oxalis, R6 E TP-001-88
CFF9 11	ABAM/(DEP): Silver fir/depauperate, R6 E TP-001-88
CFFM	Silver fir/forbs, mesic; Resource Inventory
CFFS	Silver fir/forbs, shrubs, Resource Inventory
CFM0	Silver or noble fir wetlands
CFM1	Silver or noble fir/skunk cabbage
CFM1 11	ABAM/LYAM: Silver fir/skunk cabbage, R6 E TP-001-88
CFSO	Silver or noble fir with shrub dominated ground vegetation
CFS1	Silver or noble fir/Oregon grape-salal; Resource Inventory
CFS1 51	ABAM/BENE: Silver fir/dwarf Oregon grape, R6 E 100-83, R6 E 130-83
CFS1 52	ABAM/GASH-GP: Silver fir/salal, Gifford Pinchot, R6 E 130-83
CFS1 53	ABAM/GASH-ORE: Silver fir/salal, Oregon, R6 E 100-82
CFS1 54	ABAM/GASH-OLY: Silver fir/salal, Olympic, R6 E TP-001-88
CFS1 55	ABAM/GASH/BLSP: Silver fir/salal/deerfern, R6 E TP-001-88
CFS1 56	ABAM/GASH/OXOR: Silver fir/salal/oxalis, R6 E TP-001-88
CFS2	Silver or noble fir/big huckleberries, fool's huckleberry, pachistima
CFS2 11	ABAM/VAME/XETE-OLY: Silver fir/big huckleberry/beargrass, Olympic, R6 E TP-001-88
CFS2 12	ABAM/VAAL-OLY: Silver fir/Alaska huckleberry, Olympic, R6 E TP-001-88
CFS2 13	ABAM/VAAL/ERMO: Silver fir/Alaska huckleberry/avalanche lilly, R6 E TP-001-88
CFS2 14	ABAM/VAAL/XETE: Silver fir/Alaska huckleberry/beargrass, R6 E TP-001-88
CFS2 15	ABAM/VAAL/TITR: Silver fir/Alaska huckleberry/foamflower, R6 E TP-001-88
CFS2 16	ABAM/VAAL-BENE: Silver fir/Alaska huckleberry/Oregongrape, R6 E TP-001-88
CFS2 17	ABAM/VAAL/OXOR: Silver fir/Alaska huckleberry/oxalis, R6 E TP-001-88
CFS2 18	ABAM/VAAL/CLUN: Silver fir/Alaska huckleberry/Queenscup, R6 E TP-001-88
CFS2 19	ABAM/VAAL/LIBO2: Silver fir/Alaska huckleberry/twinflower, R6 E TP-001-88
CFS2 20	ABAM/VAAL/RHAL: Silver fir/Alaska huckleberry/white rhododen. R6 E TP-001-88
CFS2 51	ABAM/VAME/XETE: Silver fir/big huckleberry/beargrass, R6 E 100-82, R6 E 130-83
CFS2 52	ABAM/RHMA/VAAL/COCA: Silver fir/rhododen./huckleb./bunchberry, R6 E 100-82
CFS2 53	ABAM/VAAL/COCA: Silver fir/Alaska huckleberry/bunchberry, R6 E 100-82
CFS2 54	ABAM/MEFE: Silver fir/fools huckleberry, R6 E 100-82, R6 E 130-83
CFS2 55	ABAM/VAAL-GASH: Silver fir/Alaska huck.-salal, R6 E 100-82, R6 E 130-83
CFS2 56	ABAM/VAME/CLUN: Silver fir/big huck./beadlilly, R6 E 100-82, R6 E 130-83
CFS2 57	ABAM/VAAL: Silver fir/Alaska huckleberry, R6 E 130-83
CFS2 58	ABAM/PAMY: Silver fir/pachistima, R6 E 132-83
CFS3	Silver or noble fir/devil's club; Resource Inventory
CFS3 11	ABAM/OPHO-OLY: Silver fir/devilsclub, Olympic, R6 E TP-001-88
CFS3 51	ABAM/OPHO: Silver fir/devilsclub, R6 E 100-82, R6 E 130-83
CFS4	Silver or noble fir/grouse huckleberry (<i>Vaccinium scoparium</i>)
CFS5	Silver or noble fir/Cascade's azalea; Resource Inventory
CFS5 50	ABAM/RHAL-GP: Silver fir/Cascade's azalea, Gifford Pinchot, R6 E 130-83
CFS5 51	ABAM/RHAL/XETE: Silver fir/azalea/beargrass, R6 E 100-82
CFS5 52	ABAM/RHAL/CLUN: Silver fir/azalea/beadlilly, R6 E 100-82
CFS5 53	ABAM/RHAL-OKAN: Silver fir/Cascade's azalea, Okanogan, R6 E 132-83

CFS6	Silver fir/rhododendron, vine maple; Resource Inventory
CFS6 11	ABAM/RHMA-OLY: Silver fir/rhododendron, Olympic, R6 E TP-001-88
CFS6 12	ABAM/RHMA/VAAL: Silver fir/rhododendron/Alaska huckleberry, R6 E TP-001-88
CFS6 51	ABAM/ACCI/TIUN: Silver fir/vine maple/foamflower, R6 E 100-82
CFS6 52	ABAM/RHMA/BENE: Silver fir/rhododendron/Oregon grape, R6 E 100-82
CFS6 53	ABAM/RHMA/XETE: Silver fir/rhododendron/beargrass, R6 E 100-82
CFSC	Silver fir/shrubs, cool, Resource Inventory
CFSD	Silver fir/shrubs, dry, Resource Inventory
CFSF	Silver fir/shrubs-forbs, coastal, Resource Inventory
CFSM	Silver fir/shrubs, mesic, Resource Inventory
CH	Hemlock, western
CHC0	Western hemlock with important associated conifers
CHC1	Western hemlock-Port Orford cedar
CHC2	Western hemlock-Douglas-fir; W.hemlock/shrub, dry, Resource Inventory
CHC2 11	TSHE-PSME/COCO: W. hem-D.fir/hazel, steep shallow soil, Will.
CHC2 12	TSHE-PSME/HODI: W. hemlock-D.fir/oceanspray, R6 E 232-86, R6 E 230-86
CHC2 13	TSHE-PSME-ARME: W. hemlock-D.fir-madrone, R6 E 230-86
CHC3	Western hemlock - White fir
CHC3 11	TSHE-ABGR/CLUN: W. hemlock-grand fir/queen's cup beadleily, R6 E TP-004-88
CHC4	Western hemlock - western red cedar
CHC5	Western hemlock - silver fir
CHC5 51	TSHE-ABAM/RHMA/BENE: W. hemlock-S.fir/rodod./Ore grape, Dyrn '74
CHC5 52	TSHE-ABAM/RHMA/LIBO2: W. hemlock-S.fir/rodod./twinlineflower, Dyrn'74
CHC5 53	TSHE-ABAM/LIBO2: W. hemlock-silver fir/twinlineflower, Dyrn. '74.
CHC6	Western hemlock-Incense cedar
CHF0	Western hemlock with forb dominated ground vegetation
CHF1	Western hemlock/swordfern/oxalis; Resource Inventory
CHF1 11	TSHE/OXOR-WILL: W. hemlock/oxalis, Willamette, R6 E 257-86
CHF1 12	TSHE/OXOR-OLY: W. hemlock/oxalis, Olympic, R6 E TP-001-88
CHF1 21	TSHE/OXOR-COAST: W. hemlock/oxalis, coastal, R6 E 220-86
CHF1 22	TSHE/POMU-COAST: W. hemlock/swordfern, coastal, R6 E 220-86
CHF1 23	TSHE/POMU-MTH: W. hemlock/swordfern, Mt. Hood, R6 E 232-86
CHF1 24	TSHE/POMU-OXOR: W. hemlock/swordfern-oxalis, R6 E 232-86, R6 E 230-86
CHF1 25	TSHE/POMU-GP: W. hemlock/swordfern, Gifford Pinchot, R6 E 230-86
CHF1 31	TSHE/POMU-OXOR-OLY: W. hemlock/swordfern/oxalis, Olympic R6 E TP-001-88
CHF1 32	TSHE/POMU-TITR: W. hemlock/swordfern-foamflower, R6 E TP-001-88
CHF1 51	TSHE/POMU-WILL: W. hemlock/swordfern, Willamette, R6 E 257-86
CHF2	Western hemlock/vanillaleaf-foamflower; W. hemlock/forb, dry, Resource Inventory
CHF2 11	TSHE/ACTR-OLY: W. hemlock/vanillaleaf, Olympic, R6 E TP-001-88
CHF2 21	TSHE/ACTR: W. hemlock/vanillaleaf, R6 E 232-86, R6 E 230-86, R6 E 257-86
CHF2 22	TSHE/TITR: W. hemlock/foamflower, R6 E 230-86

CHF3	Western hemlock/beadlily-twinflower; W. hemlock/forb, mesic, Resource Inventory
CHF3 11	TSHE/CLUN: W. hemlock/queen's cup beadlily, R6 E TP-008-88, INT-236, INT-34
CHF3 12	TSHE/ARNU3: W. hemlock/wild sarsparilla, R6 E TP-008-88
CHF3 21	TSHE/LIBO2: W. hemlock/twinflower, R6 E 257-86
CHF4	Western hemlock with fern ground vegetation
CHF4 21	TSHE/ATFI: W. hemlock/ladyfern, R6 E 230-86
CHF4 22	TSHE/GYDR: W. hemlock/oak fern, R6 E TP-008-88, INT-236
CHF5	Western hemlock/beargrass
CHF5 11	TSHE/XETE-OLY: W. hemlock/beargrass, Olympic, R6 E TP-001-88
CHF5 21	TSHE/XETE-COLV: W. hemlock/beargrass, Colville R6 E TP-008-88
CHF9 11	TSHE/(DEP): W. hemlock/depauperate, R6 E TP-001-88
CHH0	Western hemlock with important associated hardwoods
CHH1	Western hemlock/tanoak-laurel
CHH2	Western hemlock/bigleaf maple
CHH3	Western hemlock/chinkapin
CHH3 51	TSHE/CACH: W. hemlock/chinkapin, Dyrn. '74
CHH4	Western hemlock/alder
CHH5	Western hemlock/oak
CHM0	Western hemlock wetlands (moist to wet soil)
CHM1	Western hemlock/skunk cabbage wetlands
CHM1 11	TSHE/LYAM-OLY: W. hemlock/skunk cabbage, Olympic, R6 E TP-001-88
CHM1 21	TSHE/LYAM: W. hemlock/skunk cabbage, R6 E 232-86, R6 E 230-86
CHSO	Western hemlock with shrub dominated ground vegetation
CHS1	Western hemlock/low shrub, salal, Oregon grape; Resource Inventory
CHS1 11	TSHE/GASH-WILL: W. hemlock/salal, Willamette, R6 E 257-86
CHS1 12	TSHE/RHRU/GASH: W. hemlock/cascaria/salal-flat deep soil, Willa
CHS1 13	TSHE/BENE/OXOR: W. hemlock/Oregon grape/oxalis, R6 E 257-86
CHS1 14	TSHE/BENE/ACTR: W. hemlock/Oregon grape/vanilla leaf, R6 E 257-86
CHS1 21	TSHE/BENE-COAST: W. hemlock/OR.grape, coastal, R6 E. 220-86
CHS1 22	TSHE/BENE-GASH-COAST: W. hemlock/Or.grape-salal, coastal, R6 E 220-86
CHS1 23	TSHE/GASH-COAST: W. hemlock/salal, coastal, R6 E 220-86
CHS1 24	TSHE/BENE-GASH: W. hemlock/Or.grape-salal, R6 E 232-86, R6 E 257-86
CHS1 25	TSHE/BENE: W. hemlock/Or.grape, R6 E 232-1986, R6 E 230-86, R6 E 257-86
CHS1 26	TSHE/BENE/POMU: W. hemlock/Or.grape/swordfern, R6 E 232-86, R6 E 230-86
CHS1 27	TSHE/BENE-GASH-GP: W. hemlock/Or.grape-salal, Gifford Pinchot, R6 E 230-86
CHS1 28	TSHE/GASH-GP: W. hemlock/salal, Gifford Pinchot, R6 E 230-86
CHS1 31	TSHE/GASH-OLY: W. hemlock/salal, Olympic, R6 E TP-001-88
CHS1 32	TSHE/GASH/XETE: W. hemlock/salal/beargrass, R6 E TP-001-88
CHS1 33	TSHE/GASH-VAOV2: W. hemlock/salal-evergreen huckleberry, R6 E TP-001-88
CHS1 34	TSHE/GASH-HODI: W. hemlock/salal-oceanspray, R6 E TP-001-88
CHS1 35	TSHE/GASH-BENE: W. hemlock/salal-Oregon grape, R6 E TP-001-88
CHS1 36	TSHE/GASH/OXOR: W. hemlock/salal/oxalis, R6 E TP-001-88
CHS1 37	TSHE/GASH/POMU: W. hemlock/salal/swordfern, R6 E TP-001-88
CHS1 38	TSHE/BENE-OLY: W. hemlock/Oregon grape, Olympic, R6 E TP-001-88
CHS1 39	TSHE/BENE/POMU-OLY: W. hemlock/Oregon grape/swordfern, Olympic, R6 E TP-001-88
CHS2	Western hemlock/vine maple
CHS2 21	TSHE/ACCI/GASH-COAST: W. hemlock/vine maple/salal, coastal, R6 E 220-86

CHS2 22 TSHE/ACCI/POMU-COAST: W.hemlock/vine maple/sword fern, coast, R6 E 220-'86
CHS2 23 TSHE/ACCI/ACTR: W.hemlock/vine maple/vanillaleaf, R6 E 232-86
CHS2 24 TSHE/CONU/ACTR: W.hemlock/dogwood/vanillaleaf, R6 E 230-86
CHS2 51 TSHE/ACCI/POMU: W. hemlock/vine maple/sword fern, Dyrn '74

CHS3 Western hemlock/rhododendron; Resource Inventory
CHS3 11 TSHE-ABAM/RHMA-WILL: W. hemlock/S. fir/rhodod., roll deep Willa.
CHS3 12 TSHE/RHMA-ACCI-WILL: W. hemlock/rhododen.-vine maple, steep deep Willa.
CHS3 13 TSHE/ACCI-RHMA-WILL: W. hemlock/vine maple-rhododen.,unstable, Willa
CHS3 21 TSHE/RHMA/BENE-COAST: W. hemlock/rhododendron/Or.grape, coast, R6 E 220-86
CHS3 22 TSHE/RHMA/GASH-COAST: W.hemlock/rhododendron/salal, coast, R6 E 220-86
CHS3 23 TSHE/RHMA/POMU-COAST: W.hemlock/rhododendron/swordfern, coast, R6 E 220-86
CHS3 24 TSHE/RHMA/VAOV2-COAST: W.hemlock/rhodo/evergreen huck, coast, R6 E 220-86
CHS3 25 TSHE/RHMA/XETE-MTH: W.hemlock/rhododendron/beargrass, Mt. Hood, R6 E 232-86
CHS3 26 TSHE/RHMA-VAAL-COCA: W.heml/rhodo. Alaska huck/bunchbry, R6 E 232-86, R6 E 257-86
CHS3 27 TSHE/RHMA/GASH-MTH: W.hemlock/rhododen./salal, Mt. Hood, R6 E 232-86
CHS3 28 TSHE/RHMA/BENE-MTH: W.hemlock/rhododen./Or.grape, Mt. Hood, R6 232-86
CHS3 31 TSHE/RHMA-OLY: W. hemlock/rhododendron, Olympic, R6 E TP-001-88
CHS3 32 TSHE/RHMA/XETE-OLY: W. hemlock/rhododendron/beargrass, Olympic, R6 E TP-001-88
CHS3 33 TSHE/RHMA/BENE-OLY: W. hemlock/rhododendron/Oregon grape, Olympic, R6 E TP-001-88
CHS3 34 TSHE/RHMA/GASH-OLY: W. hemlock/rhododendron/salal, Olympic, R6 E TP-001-88
CHS3 35 TSHE/RHMA/POMU-OLY: W. hemlock/rhododendron/swordfern, Olympic, R6 E TP-001-88
CHS3 51 TSHE/RHMA/GASH-WILL: W. hemlock/rhododendron/salal, Willamette, R6 E 257-86
CHS3 52 TSHE/RHMA/BENE-WILL: W. hemlock/rhododendron/Ore. grape, Willamette, R6 E 257-86
CHS3 53 TSHE/RHMA/XETE-WILL: W.heml/rhododen./beargrass, Willamette, R6 E 257-86
CHS3 54 TSHE/RHMA/OXOR: W. hemlock/rhododendron/oxalis, R6 E 257-86
CHS3 55 TSHE/RHMA/LIBO2: W. hemlock/rhododendron/twinflower, R6 E 257-86

CHS4 W. hemlock/thimbleberry-salmonberry; W. hemlock/shrubs, mesic, Resource Inventory
CHS4 11 TSHE/RUPE: W.hemlock/five-leaved bramble, R6 E TP-008-88
CHS4 21 TSHE/RUSP-COAST: W.hemlock/salmonberry, coastal, R6 E 220-86
CHS4 22 TSHE/RUSP-ACCI-COAST: W.hemlock/salmonberry/vine maple, coast, R6 E 220-86
CHS4 23 TSHE/RUSP-GASH-COAST: W.hemlock/salmonberry/salal, coastal, R6 E 220-86

CHS5 W. hemlock/devil's club
CHS5 11 TSHE/OPHO-WILL: Western hemlock/devil's club, Willamette, R6 E 257-86
CHS5 12 TSHE/OPHO-OLY: W. hemlock/devil's club, Olympic, R6 E TP-001-88
CHS5 21 TSHE/OPHO-COAST: W.hemlock/devil's club, coastal, R6 E 220-86
CHS5 22 TSHE/OPHO/OXOR: W.hemlock/devil's club/oxalis, R6 E 232-86
CHS5 23 TSHE/OPHO/SMST: W.hemlock/devil's club/solomon seal, R6 E 232-86
CHS5 24 TSHE/OPHO/POMU: W.hemlock/devil's club/swordfern, R6 E 230-86

CHS6 W. hemlock/pachistima-big huckleberry
CHS6 10 TSHE/VAOV2-COAST: W.hemlock/evergrn huck, coastal, R6 E 220-86
CHS6 11 TSHE/VAAL/OPHO: W.hemlock/Alaska huck/devil's club, R6 E 232-86
CHS6 12 TSHE/VAME/XETE: W.hemlock/big huck/beargrass, R6 E 232-86
CHS6 13 TSHE/VAAL/OXOR: W.hemlock/Alaska huck/oxalis, R6 E 232-86, R6 E 230-86
CHS6 14 TSHE/VAAL-GASH: W.hemlock/Alaska huck/salal, R6 E 232-86, R6 E 230-86
CHS6 15 TSHE/VAAL-COCA: W.heml/Alaska h/bunchbry, R6 E 232-86, R6 E 230-86, R6 E 257-86
CHS6 21 TSHE/VAAL: W. hemlock/Alaska huckleberry, R6 E TP-001-88
CHS6 22 TSHE/VAAL/XETE: W. hemlock/Alaska huckleberry/beargrass, R6 E TP-001-88
CHS6 23 TSHE/VAAL/OXOR-OLY: W. hemlock/Alaska huckleberry/oxalis, Olympic, R6 E TP-001-88
CHS6 24 TSHE/VAAL-GASH-OLY: W. hemlock/Alaska huckleberry-salal, Olympic, R6 E TP-001-88

CHS7	Western hemlock/Cascade azalea, menziesia, shepherdia
CHS7 11	TSHE/MEFE: W. hemlock/rusty menziesia, R6 E TP-008-88, INT-236
CHSC	Western hemlock/rhododendron, cool, Resource Inventory
CHSD	Western hemlock/salal-Or.grape, dry, Resource Inventory
CHSF	Western hemlock/shrub/oxalis, Resource Inventory
CHSM	Western hemlock/rhododendron, mesic, Resource Inventory
CHZ4 12	Siuslaw (12):conifer-hardwood, hemlock, cedar, spruce dom.
CHZ6 12	Siuslaw (12):conifer, hemlock, cedar, spruce dominant
CJ	Juniper
CJC0	Juniper with associated conifers
CJG0	Juniper with grass dominated ground vegetation; Resource Inventory
CJG1	Juniper/wheatgrass
CJG1 11	JUOC/AGSP-FEID: Juniper/wheatgrass-fescue, R6 AG 3-1, R6 E 255-86
CJG1 12	JUOC/AGSP/POSA3: Juniper/wheatgrass/bluegrass, Dris '64
CJG2	Juniper/fescue
CJG2 11	JUOC/FEID-AGSP: Juniper/fescue/bluegrass, Dris '64
CJG2 12	JUOC/AGSP-FEID/POSA3: Juniper/wheatgrass-fescue/bluegrass, Dris '64
CJS0	Juniper with shrub dominated ground vegetation
CJS1	Juniper/low sagebrush; Resource Inventory
CJS1 11	JUOC/ARAR/AGSP-FEID: Juniper/low sage/wheatgrass-fescue, R6 AG 3-1
CJS1 12	JUOC/ARAR/FEID: Juniper/low sage/Idaho fescue, R6 E 79-004
CJS2	Juniper/big sagebrushes; Resource Inventory
CJS2 11	JUOC/ARTR/AGSP-FEID: Juniper/big sage/wheatgrass-fescue, R6 AG 3-1
CJS2 12	JUOC/ARTR/FEID-AGSP-NORTH: Juniper/sage/fescue-wheatgr., R6 E 133-83
CJS2 13	JUOC/ARTR/AGSP/POSA-SOUTH: Juniper/sage/wheatgrass, R6 E 133-83
CJS2 21	JUOC/ARTR/AGSP: Juniper/sage/wheatgrass, Dris '64
CJS2 22	JUOC/ARTR/AGSP-CHDO: Juniper/sage/wheatgrass-chaenactis, Dris '64
CJS2 23	JUOC/ARTR/AGSP-ASLE: Juniper/sage/wheatgrass/astragalus, Dris '64
CJS2 24	JUOC/ARTR/FEID: Juniper/sage/fescue, Dris '64
CJS2 25	JUOC/ARTR/FEID-LUP: Juniper/sage/fescue-lupine, Dris '64
CJS2 26	JUOC/ARTR/AGSP-FEID-FLAT: juniper/sage/bunchgrass, flat, R6 E 133-83
CJS2 31	JUOC/ARTR-HODU/AGSP-BASA,S.CAN: Juniper/sage-rock spirea, R6 E 133-83
CJS2 32	JUOC/ARTR-CHVI/FEID-BASA,N.CAN: Juniper/sage rabbitb, R6 E 133-83
CJS2 36	JUOC/ARTR-PUTR: Juniper/sage-bitterbrush, Dris '64
CJS2 91	JUOC/CHVI-ARTR/AGCR: Juniper/rabbitbrush-sage/cr.wheat, R6 E 133-83
CJS2 92	JUOC/CHVI-ARTR/AGIN: Juniper/rabbitbrush-sage/beard.wht, R6 E 133-83
CJS3	Juniper/bitterbrush
CJS3 11	JUOC/PUTR/AGSP-FEID: Juniper/bitterbrush/bunchgrass, R6 E 104-85
CJS4	Juniper/mountain mahogany
CJS8	Juniper/stiff sage scabland
CJS8 11	JUOC/ARRI-SCAB: Juniper/stiff sage scabland, R6 AG 3-1
CJSB	Juniper biscuit-swale system

CJSB 11	JUOC/ARTR/FEID-AGSP, MOUND: Juniper/sage/fescue, mound, R6 E 133-83
CL	Lodgepole pine, shore pine (climax or stable)
CLC0	Lodgepole pine with associated conifer trees; Lodgepole-whitebark pine, Resource Inventory
CLC1	Lodgepole-whitebark pine-alpine
CLC1 11	PICO-PIAL/PELA: Lodgepole-whitebark pine/penstemon, R6 E 79-004
CLC1 12	PICO-PIAL-PIMO/ARCO2: Lodgepole-whitebark/sandwort, R6 E 79-004
CLC2	Lodgepole-Douglas-fir serpentine, juniper, manzanita
CLC3	Lodgepole, ponderosa
CLC4	Lodgepole, Douglas-fir
CLC5	Lodgepole, mountain hemlock
CLF0	Lodgepole pine with forb dominated ground vegetation
CLF1	Lodgepole pine/forbs less 1/2 meter tall
CLF1 11	PICO/FORB: Lodgepole/forb (princes pine, lupine), R6 E 79-005
CLF2 11	PICO/LIBO2: Lodgepole/twinflower, R6 E 255-86
CLG0	Lodgepole pine with grass dominated ground vegetation
CLG1	Lodgepole pine/bunchgrass
CLG2	Lodgepole pine/rhizomatous grass
CLG2 11	PICO/CARU-VASC: Lodgepole/pinegrass-grouse huckleberry, R6 AG 3-1
CLG3	Lodgepole pine/bunchgrass on pumice
CLG3 11	PICO/STOC-BASIN: Lodgepole/needlegrass basins, pumice, R6 E 104-85
CLG3 13	PICO/STOC-LINU-PUM: Lodgepole/needlegrass, pumice, R6 E 104-85
CLG3 14	PICO/STOC-LUCA-PUM: Lodgepole/needlegrass-lupine, pumice, R6 E 104-85
CLG3 15	PICO/FRVI-FEID: Lodgepole/strawberry-Idaho fescue, R6 E 79-004
CLG4	Lodgepole pine/rhizomatous grass on pumice; Resource Inventory
CLG4 11	PICO/CAPE-LUCA-PUM: Lodgepole/sedge-lupine, pumice, R6 E 104-85
CLG4 12	PICO/CAPE-PEEU-PUM: Lodgepole/sedge-penst, pumice, R6 E 104-85
CLG4 13	PICO/CAPE-STOC,BASIN: Lodgepole/sedge-needlegr basins, pumice, R6 E 104-85
CLG4 15	PICO/SIHY-CAPE: Lodgepole/squirreltail-sedge, R6 E 79-004
CLG5	Lodgepole pine/rhizomatous grass, non-pumice
CLH0	Lodgepole pine with associated hardwoods
CLH1	Lodgepole pine with quaking aspen
CLH1 11	PICO-POTR/FRVI: Lodgepole/aspen/strawberry, R6 E 79-004
CLM0	Lodgepole wetlands (moist to wet soils)
CLM1	Lodgepole pine/sedge-grass wetland; Resource Inventory
CLM1 11	PICO/CANE-PUM: Lodgepole/sedge-forb wetland, pumice, R6 E 104-85
CLM1 12	PICO/POPR: Lodgepole pine/Kentucky bluegrass, R6 E TP-279-87
CLM1 13	PICO/CAEU: Lodgepole pine/widefruit sedge, R6 E TP-279-87
CLM1 14	PICO/CAAQ: Lodgepole pine/aquatic sedge, R6 E TP-279-87
CLM1 15	PICO/DECA: Lodgepole pine/tufted hairgrass, R6 E TP-279-87

CLM2	Lodgepole pine/dwarf shrub-grass wetland
CLM2 11	PICO/ARUV-PUM: Lodgepole/bearberry-pum, R6 E 104-85, R6 E TP-279-87
CLM3	Lodgepole pine/low huckleberry-grass wetland
CLM3 11	PICO/VAOC-PUM: Lodgepole/blueberry-forb pum, R6 E 104-85, R6 E TP-279-87
CLM3 12	PICO/VAOC2/CAEU: Lodgepole/bog blueberry/widefruit sedge, R6 E TP-279-87
CLM3 13	PICO/SPDO-FORB: Lodgepole/Douglas'spiraea/forb, R6 E TP-279-87
CLM3 14	PICO/SPDO/CAEU: Lodgepole/Douglas'spiraea/widefruit sedge, R6 E TP-279-87
CLM4 11	PICO/XETE-PUM: Lodgepole/beargrass, pumice, R6 E 104-85
CLM9 11	PICO-PIEN/ELPA2: Lodgepole-spruce/few-flowered spikerush, R6 E TP-279-87
CLSO	Lodgepole pine with shrub dominated ground vegetation
CLS1	Lodgepole pine/big sagebrush
CLS1 11	PICO/ARTR/FEID-PUM: Lodgepole/sage/fescue, pumice, R6 E 104-85
CLS1 12	PICO/ARTR-RHYO: Lodgepole/sage, rhyolite, pumice, R6 E 104-85
CLS2	Lodgepole pine/bitterbrush; lodgepole/shrub, xeric, Resource inventory
CLS2 11	PICO/PUTR/STOC-PUM: Lodgepole/bitterbr/needlegr, pumice, R6 E 104-85
CLS2 12	PICO/PUTR/CAPE-PUM: Lodgepole/bitterbr/sedge, pumice, R6 E 104-85
CLS2 13	PICO/PUTR/FORB-PUM: Lodgepole/bitterbr/forb, pumice, R6 E 104-85
CLS2 14	PICO/PUTR/FEID-PUM: Lodgepole/bitterbr/fescue, pumice, R6 E 104-85
CLS2 15	PICO/RICE-PUTR/STOC-PUM: L.P./current-bitterbr/needlegr, pumice, R6 E 104-19
CLS2 16	PICO/PUTR-RHYO: Lodgepole/bitterbrush, rhyolite, R6 E 104-85
CLS3	Lodgepole pine/pinemat manzanita
CLS3 11	PICO/ARNE/STOC-PUM: Lodgepole/pinemat manz/needlegr, pumice, R6 E 104-85
CLS4	Lodgepole pine/grouse huckleberry; lodgepole/shrub, cool xeric Resource Inventory
CLS4 11	PICO/VASC-BLUE: Lodgepole/grouse huckl, Blue Mtns, R6 AG 3-1
CLS4 12	PICO/VASC-PUM: Lodgepole/grouse huckl, pumice, R6 E 104-85
CLS4 13	PICO/VASC/FORB: Lodgepole/grouse huckl/forb, R6 E 79-005
CLS4 14	PICO/VASC/CAPE: Lodgepole/grouse huckl/sedge, R6 E 79-005
CLS4 15	PICO/VASC-WALLO: Lodgepole/grouse huckleberry, Wallowa, R6 E 255-86
CLS5	Lodgepole pine/big huckleberry, buffaloberry, menziesia
CLS5 11	PICO/VAME/BLUE: Lodgepole/big huckleberry, Blue Mtns, R6 AG 3-1
CLS5 15	PICO/VAME-WALLO: Lodgepole/big huckleberry, Wallowa, R6 E 255-86
CLS5 21	PICO/SHCA: Lodgepole pine/russet buffaloberry, R6 E TP-008-88
CLS8	Lodgepole pine/coastal-salal-huckleberry
CLS8 11	Deflation plain: lodgepole/salal-evergrn huck/sedge, Sius
CLS8 12	Floodplain dune: lodgepole/rhododen/evergrn huck. Sius
CLS8 21	Stablilized dune: lodgepole/rhododen/evergrn huck. Sius
CLS8 22	Eroding dune: lodgepole/rhododen/evergrn huck. Sius
CLS8 23	Dune slip face: lodgepole/rhododen/evergrn huck Sius
CLS8 31	Rolling dune: open lodgepole/kinnikinic-hairy manz. Sius
CLS9 11	PICO/CEVE-ARPA-PUM: Lodgepole/snowbrush-manzanita, pumice, R6 E 104-85
CLSM	Lodgepole pine/shrub, mesic, Resource Inventory

CLX1 04	Malheur(04) 4A:slope less 30%, CLG2 11, CLS5 11, CLS4 11
CLX1 20	Winema(20): CLG4 11, CLS2 12, CLG3
CLX2 04	Malheur(04) 4B:slope 30-70%, CLG2 11, CLS5 11, CLS4 11
CLX2 20	Winema(20): CLG3 11, CLM1 11, CLM2 11, CLS2 14
CLX3 20	Winema(20): CLM2 11, CLS2 11, CLS2 13
CLX4 20	Winema(20): CLG3 11
CLX5 20	Winema(20): CLG9, CLS9
CM	Mountain hemlock
CMC0	Mountain hemlock with important associated conifers
CMC1	Mountain hemlock-alaska cedar
CMC1 51	CANO/OPHO: Alaska cedar/devil's club, Dyrn '74
CMC2	Mountain hemlock - true firs
CMF0	Mountain hemlock with forb dominated ground vegetation
CMF1	Mountain hemlock/beargrass
CMF1 21	TSME/XETE-DAUB: Mtn. hemlock/beargrass, Daub '68
CMF2	Mountain hemlock/tiarella, vanillaleaf
CMF3	Mountain hemlock/evergreen forbs (pyrola)
CMFC	Mountain hemlock/forb, cool, Resource Inventory
CMG0	Mountain hemlock with grass dominated ground vegetation
CMG1	Mountain hemlock/pinegrass
CMG2	Mountain hemlock/woodrush (Luzula); Resource Inventory
CMG2 11	TSME/LUZULA: Mtn. hemlock/woodrush, R6 E 257-86
CMG3	Mountain hemlock/sedge
CMS0	Mountain hemlock with shrub dominated ground vegetation
CMS1	Mountain hemlock/grouse huckleberry/pinemat manzanita; Resource Inventory
CMS1 11	TSME/VASC/CAPE-PUM: Mtn. hem/grouse huckl/sedge, pumice, R6 E 79-005
CMS1 13	Same as CMS1 11
CMS1 14	TSME/VASC: Mtn. hemlock/grouse huckleberry, R6 E 100-82, R6 E 257-86
CMS1 31	TSME/VASC-WALLO: Mtn. hemlock/grouse huckleberry, Wallowa, R6 E 255-86
CMS2	Mountain hemlock/big huckleberries, fool's huckleberry; Resource Inventory
CMS2 10	TSME/VAME-GP: Mtn. hemlock/big huckleberry, Gifford Pinchot, R6 E 130-83
CMS2 11	TSME/VACC-PUM-WILL: Mtn. hemlock/huckl, steep pumice, Will.
CMS2 12	TSME/VACC-ASH-WILL: Mtn. hemlock/huckl, ash, Will.
CMS2 13	TSME/VACC-SAND-WILL: Mtn. hemlock-fir/huckl. black sand, Will.
CMS2 14	TSME/VACC-S.ASH-WILL: Mtn. hemlock-fir/huckl.steep ash,Will.
CMS2 15	TSME/VACC-CIND-WILL: Mtn. hemlock-pine/huckl., cinders, Will.
CMS2 16	TSME/VAME/XETE: Mtn. hemlock/huckleberry/beargrass, R6 E 100-82, R6 E 257-86
CMS2 20	TSME/MEFE-DAUB: Mtn. hemlock/fool's huckleberry, Daub '68
CMS2 21	TSME/MEFE-GP: Mtn. hemlock/fool's huckleberry, Gifford Pinchot, R6 E 130-83
CMS2 31	TSME/VAME-WALLO: Mountain hemlock/big huckleberry, Wallowas, R6 E 255-86
CMS2 41	TSME/VAAL: Mtn. hemlock/Alaska huckleberry, R6 E TP-001-88
CMS2 42	TSME/VAAL/ERMO: Mtn. hemlock/Alaska huckleberry/avalanche lilly, R6 E TP-001-88
CMS2 43	TSME/VAAL/XETE: Mtn. hemlock/Alaska huckleberry/beargrass, R6 E TP-001-88
CMS2 44	TSME/VAME-VAAL: Mtn. hemlock/big huckleberry/Alaska huckleberry, R6 E TP-001-88

CMS2 45	TSME/VAME/XETE-OLY: Mtn. hemlock/big huckleberry/beargrass, Olympic, R6 E TP-001-88
CMS3	Mountain hemlock/rustyleaf-azalea-heath-heather
CMS3 11	TSME/PHEM-VADE: Mtn. hemlock/red heather-blueleaf huckleberry, R6 E TP-001-88
CMS3 12	TSME/RHAL-VAME: Mtn. hemlock/white rhododen.-big huckleberry, R6 E TP-001-88
CMS3 23	TSME/RHAL: Mtn. hemlock/Cascade's azalea, R6 E 130-83
CMS4	Mountain hemlock/devil's club; Resource Inventory
CMS5	Mountain hemlock/low shrub
CMS6	Mountain hemlock/vine maple, ocean spray, rhododen.;Resource Inventory
CMS6 11	TSME-PSME/ACCI-LAVA-WILL: Mtn. heml/Do.-fir/vine maple,lava,Will.
CMS6 12	TSME/RHMA: Mtn. hemlock/rhododendron, R6 E 257-86
CMSC	Mountain hemlock/Alaska huckleberry; Resource Inventory
CP	Ponderosa, Jeffrey pine
CPC0	Pondersa, Jeffrey pine with assoc conifer(s); Jeffery pine-conifer, Resource Inventory
CPC1	Ponderosa pine-incense cedar
CPC2	Ponderosa-juniper
CPC2 11	PIPO-JUOC/CELE/FEID: Ponderosa-juniper/mt.mahogany/fescue, R6 E 79-004
CPC3	Ponderosa pine - lodgepole pine
CPC4	Jeffrey pine dominant
CPC5	Jeffrey pine-white pine
CPF0	Ponderosa, Jeffery pine with forb ground vegetation; Jeffery pine/forb, Resource Inventory
CPF1 11	PIPO/WYMO: Ponderosa pine/wyethia, R6 E 79-004
CPG0	Ponderosa, Jeffrey pine with grass ground vegetation; Jeffery pine/grass, Resource Inventory
CPG1	Ponderosa pine/bunchgrass--non pumice; Resource Inventory
CPG1 11	PIPO/AGSP-BLUE: Ponderosa/wheatgrass, Blue Mtns, R6 AG 3-1
CPG1 12	PIPO/FEID-BLUE: Ponderosa/Idaho fescue, Blue Mtns, R6 AG 3-1
CPG1 21	PIPO/AGSP-DAUB: Ponderosa/wheatgrass, Daub '68
CPG1 22	PIPO/FEID-DAUB: Ponderosa/Idaho fescue, Daub '68
CPG1 23	PIPO/STOC-DAUB: Ponderosa/needlegrass, Daub '68
CPG1 31	PIPO/FEID-WALLO: Ponderosa pine/Idaho fescue, Wallowa, R6 E 255-86
CPG1 32	PIPO/AGSP-WALLO: Ponderosa pine/wheatgrass, Wallowa, R6 E 255-86
CPG2	Ponderosa/rhizomatous grass-sedge; Resource Inventory
CPG2 12	PIPO/CAPE-FEID: Ponderosa/sedge-fescue-peavine, R6 E 104-85
CPG3	Ponderosa/bunchgrass--pumice soil
CPG6	Jeffrey pine--serpentine/gabbro bunchgrass
CPH0	Ponderosa, Jeffrey pine with important associated hardwoods
CPH1	Ponderosa, Jeffrey-madrone-manzanita
CPH2	Ponderosa, Jeffrey-oak, white or black
CPH2 11	PIPO-QUGA/BASA: Ponderosa-white oak/arrowleaf balsamroot, R6 E TP-004-88

CPH2 12 PIPO-QUGA/PUTR: Ponderosa-white oak/bitterbrush, R6 E TP-004-88
 CPH3 Ponderosa, Jeffrey pine with quaking aspen
 CPH3 11 PIPO-POTR/PONE: Ponderosa/aspen/wheeler bluegrass, R6 E 79-004
 CPH4 Jeffrey pine-oak

 CPM0 Ponderosa, Jeffrey pine wetlands (moist to wet soil)
 CPM1 Ponderosa, Jeffrey pine/wildrye-bluegrass
 CPM1 11 PIPO/ELGL: Ponderosa/blue wildrye, R6 AG 3-1

 CPS0 Ponderosa, Jeffrey pine with shrub ground vegetation;Jeffery pine/shrub, Resource Inventory
 CPS1 Ponderosa, Jeffrey/big sagebrush; Resource Inventory
 CPS1 11 PIPO/PUTR-ARTR/FEID: Ponderosa/bitterbr-sage/fescue, R6 E 104-85
 CPS1 12 PIPO/PUTR-ARTR/SIHY-RYHO: Ponder/bitterbr-sage/squirreltail, R6 E 104-85
 CPS1 21 PIPO/ARTR/PONE: Ponderosa/sage/wheeler bluegrass, R6 E 79-004

 CPS2 Ponderosa, Jeffrey/bitterbrush; Resource Inventory
 CPS2 11 PIPO/PUTR/FEID-PUM: Ponderosa/bitterbr/fescue, pumice, R6 E 104-85
 CPS2 12 PIPO/PUTR/STOC-PUM: Ponderosa/bitterbr/needlegr, pumice, R6 E 104-85
 CPS2 13 PIPO/PUTR-ARPA/STOC-PUM: Ponderosa/bitterbr-manz/needlegr, pum, R6 E 104-85
 CPS2 14 PIPO/PUTR-ARPA/CAPE-PUM: Ponderosa/bitterbr-manz/sedge, pumice, R6 E 104-85
 CPS2 15 PIPO/PUTR/CAPE-PUM: Ponderosa/bitterbr/sedge, pumice, R6 E 104-85
 CPS2 16 PIPO/PUTR/FEID-AGSP-PUM: Ponderosa/bitterbr/bunchgr, pumice, R6 E 104-85
 CPS2 17 PIPO/PUTR-ARPA/FEID-PUM: Ponderosa/bitterbr-manz/fescue, pumice, R6 E 104-85
 CPS2 18 PIPO/PUTR/SIHY-RHYO: Ponderosa/bitterbr/squirreltail, rhyolite, R6 E 104-85
 CPS2 21 PIPO/PUTR/CARO: Ponderosa/bitterbrush/ross sedge, R6 AG 3-1
 CPS2 22 PIPO/PUTR-DAUB: Ponderosa/bitterbrush, Daub. '68
 CPS2 23 same as CPS2 11
 CPS2 24 same as CPS2 17
 CPS2 31 PIPO/PUTR/AGSP: Ponderosa pine/bitterbrush/wheatgrass, R6 E 255-86

 CPS3 Ponderosa pine/ceanothus; Ponderosa pine/bitterbruch/fescue, Resource Inventory
 CPS3 11 PIPO/PUTR-CEVE/STOC-PUM: Ponder/bitterbr-ceanothus/needlegr, R6 E 104-85
 CPS3 12 PIPO/PUTR-CEVE/CAPE-PUM: Ponder/bitterbr-ceanothus/sedge, R6 E 104-85
 CPS3 14 PIPO/PUTR-CEVE/FEID: Ponder/bitterbr-ceanothus/fescue, R6 E 104-85

 CPS4 Ponderosa pine/oceanspray-cherry tall shrub

 CPS5 Ponderosa pine/snowberry-spiraea; Resource Inventory
 CPS5 11 PIPO/SYAL-FLOOD: Ponderosa/snowberry/floodplain, R6 E TP-279-87
 CPS5 12 PIPO-MC/SPDO-SYAL: Ponderosa-mixed conifer/spiraea-snowberry, R6 E TP-279-87
 CPS5 21 PIPO/SYAL-DAUB: Ponderosa/snowberry, Daub '68
 CPS5 22 PIPO/SYAL-WALLO: Ponderosa pine/common snowberry, Wallowa, R6 E 255-86
 CPS5 23 PIPO/SPBE: Ponderosa pine/spiraea, R6 E 255-86

 CPS6 Ponderosa pine/manzanita-deerbrush

 CPS7 Ponderosa pine/ninebark
 CPS7 21 PIPO/PHMA-DAUB: Ponderosa/ninebark, Daub '68

 CPX1 04 Malheur(04) 6A: slope -30%, CPG1 12, CPS2 21, CPM1 11;CDG111
 CPX1 20 Winema(20): CPS2 11, CPG3 11
 CPX2 04 Malheur(04) 6B: 30-70%,CPG1 12,CPS2 21,CPM1 11,CDG1 11

CPX2 20	Winema(20): CPS2 12, CPS2 13, CPS3 11
CPX3 04	Malheur(04) 6C:30-70%,tuff,CPG1 11,CPS2 21,CPM1 11,CDG1 11
CPX3 20	Winema(2): CPS2 13, CPS2 15, CPS3 12, CPS2 13,CWS1 12
CPX4 04	Malheur(04)6D:less 30%,SERP,CPG1 11, CPS2 21, CPM1 11,CDG1 11
CPX4 20	Winema(20): CPS3, CPS6
CPX5 04	Malheur(04) 6E:30-70%,serp,CPG1 11, CPS2 21, CPM1 11,CDG1 11
CPX5 20	Winema(20): CPC2
CPY1 04	Malheur(04) 6F: ponderosa/wyethia, slope less 30%
CQ	Western white pine, sugar pine
CR	Red fir (shasta red)
CRC0	Red fir with associated conifers
CRC1	Red fir-incense cedar
CRC2	Red fir-Alaska cedar; Resource Inventory
CRC3	Red fir-white fir; Resource Inventory
CRF0	Red fir with forb dominated ground vegetation
CRF1	Red fir/ericaceous forb (pyrola, chimaphila)
CRF2	Red fir/short forbs; Red fir/grass-forb, Resource Inventory
CRG0	Red fir with grass or sedge dominated vegetation
CRG1 11	ABMAS/CAPE: Red fir/long stolon sedge, R6 E 79-005
CRH0	Red fir with important associated hardwood(s)
CRH1	Red fir/oaks; Red fir/sadler's oak, Resource Inventory
CRS0	Red fir with shrub dominated ground vegetation
CRS1	Red fir/grouse huckleberry/pinemat manzanita
CRS1 11	ABMAS/ARNE/STOC: Red fir/manzanita/needlegrass, R6 E 104-85
CRS1 12	ABMAS-TSME/ARNE/CAPE: Red fir-Mt. Hemlock/manzanita/sedge, R6 E 79-005
CRS2	Red fir/blackberry-snowberry
CRS3	Red fir/chinquapin
CRS3 11	ABMAS/CACH/CHUM-CAPE: Red fir/chink/princes pine-sedge, R6 E 79-005
CRS3 13	same as CRS3 11
CRS4	Red fir/huckleberries, shepherdia, rusty leaf
CS	Spruce, sitka
CSC0	Sitka spruce with associated conifers
CSF0	Sitka spruce with forb dominated ground vegetation
CSF1	Sitka spruce/swordfern; Resource Inventory
CSF1 11	PISI/POMU-OXOR: Sitka spruce/swordfern-oxalis, R6 E TP-001-88
CSF1 21	PISI/POMU: Sitka spruce/swordfern, R6 E 220-86
CSF2	Sitka spruce/ladyfern-twistedstalk

CSF3	Sitka spruce/oxalis
CSF3 21	PISI/OXOR: Sitka spruce/oxalis, R6 E 220-86
CSH0	Sitka spruce with important associated hardwood(s)
CSH1	Sitka spruce/California laurel
CSH2	Sitka spruce/elderberry
CSH3	Sitka spruce/bigleaf maple
CSM0	Sitka spruce wetland (moist to wet soil)
CSM1	Sitka spruce/willow-waxmyrtle
CSS0	Sitka spruce with shrub dominated ground vegetation
CSS1	Sitka spruce/evergreen huckleberry
CSS2	Sitka spruce/red huckleberry
CSS2 21	PISI/MEFE/VAPA: Sitka spruce/fools huckleberry-red huck., R6 E 220-86
CSS3	Sitka spruce/salal
CSS3 21	PISI/GASH: Sitka spruce/salal, R6 E 220-86
CSS4	Sitka spruce/rhododendron
CSS4 11	Stabilized dune/sitka spruce-D.fir/rhodo-evergrn huck.Sius
CSS4 12	Flood plain/sitka spruce-lodgepole-w. hemlock/rhodo.Sius
CSS4 21	Sandy,steep/sitka spruce-D.fir/rhodo-evergr huck.Sius.
CSS4 22	Sandy,gentle/sitka spruce-D.fir/rhodo-evergr huck.Sius.
CSS5	Sitka spruce/thimbleberry-salmonberry; Resource Inventory
CSS5 21	PISI/RUSP: Sitka spruce/salmonberry, R6 E 220-86
CSS5 22	PISI/RUSP-GASH: Sitka spruce/salmonberry-salal, R6 E 220-86
CSS6	Sitka spruce/devil's club
CSS6 21	PISI/OPHO: Sitka spruce/devil's club, R6 E 220-86
CSS7	Sitka spruce/vine maple
CT	Port orford cedar
CTH0	Port orford cedar with hardwoods
CTH1	Port orford cedar/oaks; Resource Inventory
CTH2	Port orford cedar/big leaf maple
CTS0	Port orford cedar with shrub ground vegetation
CTS1	Port orford cedar/Oregon grape; Resource Inventory
CTS2	Port orford cedar/salal
CTS3	Port orford cedar/box-leaved silktassle
CW	White fir, grand fir
CWCO	White, grand fir with associated conifers
CWC1	White fir-incense cedar-pine
CWC1 11	ABCO-PIPO-CADE/AMAL: W.fir-ponderosa-cedar/serviceberry, R6 E 79-004

CWC2	White fir-Douglas-fir-Ponderosa pine; White fir-SW Or., hot, Resource Inventory
CWC2 11	ABCO-PSME/CEVE-CACH/PTAQ: Mixed conifer/snowbrush-chink/bracken, R6 E 104-85
CWC2 12	ABCO-PSME/CEVE-CACH/CARU: Mixed conifer/snowbrush-chink/pinegr, R6 E 104-85
CWC2 13	ABCO/CEVE/CAPE-PTAQ: Mixed conifer/snowbrush/sedge-bracken, R6 E 104-85
CWC2 14	same as CWC2 15
CWC2 15	ABCO-PSME/CEVE/ARUV: Mixed conifer/snowbush/bearberry, R6 E 79-005
CWC3	White fir - lodgepole pine (lodgepole reproducing)
CWC3 11	ABCO-PICO/STOC-CAPE: White fir-lodgepole/needlegr-sedge, R6 E 79-004
CWC4	White fir - ponderosa - white or sugar pine (no Douglas-fir)
CWC4 11	ABCO-PIPO-PIMO/RICE: White fir-ponderosa-white p./current, R6 E 79-004
CWC4 12	ABCO-PIPO-PILA/ARPA: White fir-ponderosa-sugar p./manz, R6 E 79-004
CWC5	White, grand fir/Englemann spruce, Brewer spruce, Resource Inventory
CWC5 11	ABGR-PIEN/SMST: Grand fir-Engelmann spruce/starry solomonplume, R6 E TP-004-88
CWC6	White fir-Port Orford cedar; White fir-SW Or., Mesic, Resource Inventory
CWC7	White, grand fir-true firs (Silver, Shasta red)
CWC8	White, grand fir/western yew
CWF0	White, grand fir with forb dominated ground vegetation
CWF1	White fir/vanillaleaf-foamflower
CWF2	White fir/pyrola-pipsissewa
CWF3	White, grand fir/twinflower
CWF3 11	ABGR/LIBO2-FORB: Grand fir/twinflower/forb, R6 AG 3-1, R6 E 255-86
CWF3 21	ABGR/LIBO2: Grand fir/twinflower, R6 E TP-004-88
CWF4	White, grand fir/beadlilly, low forb
CWF4 11	ABGR/CLUN: Grand fir/queen's cup beadlily, R6 E TP-008-88, INT-34
CWF4 21	ABGR/CLUN-WALLO: Grand fir/queen's cup, Wallowa, R6 E 255-86
CWF4 22	ABGR/TABR/CLUN: Grand fir/yew/queen's cup, R6 E 255-86
CWF4 31	ABCO/CLUN: White fir/queen's cup beadlilly, R6 E TP-279-87
CWF5	White, grand fir mid-forb ground vegetation
CWF5 11	ABGR/COCO2: Grand fir/gold thread, R6 E. 255-86
CWF5 21	ABGR/TRLA2: Grand fir/starflower, R6 E TP-004-88
CWF5 22	ABGR/ACTR: Grand fir/vanillaleaf, R6 E TP-004-88
CWF5 23	ABGR/POPU: Grand fir/skunk-leaved polemonium, R6 E TP-004-88
CWFC	White fir/forb, cool, Resource Inventory
CWFM	White fir/forb, mesic, Resource Inventory
CWG0	White, grand fir with grass dominated ground vegetation
CWG1	Grand fir/pinegrass-elk sedge; Resource Inventory
CWG1 11	ABGR/CARU-RESID: Mixed conif/pinegrass, residual soil, R6 AG 3-1
CWG1 12	ABGR/CARU-ASH: Mixed conif/pinegrass, ash soil, R6 AG 3-1, R6 E 255-86
CWG1 21	ABGR/CAGE: Grand fir/elk sedge, R6 E TP-004-88
CWG1 22	ABGR/CAGE-GP: Grand fir/elk sedge, Gifford Pinchot, R6 E TP-006-88

CWG1 23 ABGR/CARU: Grand fir/pinegrass, R6 E TP-006-88

CWG2 White, grand fir/columbia brome

CWH0 White, grand fir with important associated hardwood(s)

CWH1 White, grand fir/chinquapin

CWH1 11 ABCO/CEVE-CACH/STOC-PUM: White fir/ceano-chink/needlegr, pumice, R6 E 104-85

CWH1 12 ABCO/CACH/PAMY/CHUM: White fir/chink/boxw/princes pine, R6 E 79-005

CWH2 White, grand fir with quaking aspen

CWH2 11 ABCO-PIPO-POTR/CAR: White fir-ponderosa-aspen/sedge, R6 E 79-004

CWH3 White fir/tanoak, canyon oak

CWH4 White, grand fir/vine maple, Douglas maple, dogwood; Resource Inventory

CWH5 White fir/sadlers oak

CWM0 White, grand fir wetlands (meadows)

CWM1 White fir/alder/snowberry-shrub meadows, R6 E 104-85

CWM1 11 ABCO/ALTE/SYAL: White fir/alder/shrub meadow, R6 E 79-005

CWS0 White, grand fir with shrub dominated ground vegetation

CWS1 White, grand fir/ceanothus, manzanita

CWS1 12 ABCO/CEVE-ARPA-PUM: White fir/ceanoth-manz,pumice, R6 E 104-85

CWS1 13 ABCO/ARPA-SYAL/CAPE: Mixed conif/manz-snowbr/sedge, R6 E 104-85

CWS1 14 ABCO/CEVE-PUM: Mixed conifer/ceanothus/pumice, R6 E 104-85

CWS1 15 ABCO/CEVE/CAPE: Mixed conifer/ceanothus/sedge, R6 E 104-85

CWS1 16 ABCO/CEVE/CEPR-FRVI: Mixed conif/ceano/squawcarpet-strawb, R6 E 79-005

CWS1 17 ABCO-PIPO/ARPA/BERE: White fir-ponderosa/manz/Ore. grape, R6 E 79-004

CWS2 White, grand fir/huckleberry, Oregon grape

CWS2 11 ABGR/VAME: Grand fir/big huckleberry, R6 AG 3-1, R6 E 255-86

CWS2 21 ABGR/VAME/LIB02: Grand fir/big huckleberry/twinflower, R6 E TP-006-88

CWS2 22 ABGR/VAME/CLUN: Grand fir/big huckleberry/queen's cup beadrily, R6 E TP-006-88

CWS2 23 ABGR/RUPA/DIHO : Grand fir/thimbleberry/fairy bells, R6 E TP-006-88

CWS2 24 ABGR/BENE/ACTR: Grand fir/dwarf Oregongrape/vanillaleaf, R6 E TP-006-88

CWS3 White, grand fir/spiraea-snowberry; White fir/low shrub, mesic, Resource Inventory

CWS3 11 same as CWH1 12

CWS3 12 ABCO/SYAL/FRVI: White fir/snowberry/strawberry, R6 E 79-005

CWS3 13 ABCO-PIPO/SYAL/STJA: White fir - ponderosa/snowberry/starwort, R6 E 79-004

CWS3 21 ABGR/SPBE: Grand fir/spiraea, R6 E 255-86

CWS3 31 ABGR/SYMPH: Grand fir/snowberry R6 E TP-004-88

CWS3 32 ABGR/SYMO/ACTR: Grand fir/creeeping snowberry, vanillaleaf, R6 E TP-006-88

CWS4 White, grand fir/ninebark

CWS4 12 ABGR/ACGL/PHMA: Grand fir/Rocky Mtn. maple/ninebark, R6 E 255-86

CWS4 21 ABGR/PHMA: Grand fir/ninebark, R6 E TP-008-88, INT 236

CWS5 White, grand fir/oceanspray-Oregon grape, vine maple, salal; Resource Inventory

CWS5 11 ABCO/HODI/LOM-STD: White fir/oceanspray/lomatium, steep shallow soil, William.

CWS5 21 ABGR/ARUV: Grand fir/bearberry, R6 E 257-86

CWS5 22	ABGR/BENE: Grand fir/dwarf Oregon grape, R6 E 257-86
CWS5 31	ABGR/HODI: Grand fir/oceanspray, R6 E TP-004-88
CWS5 32	ABGR/ACCI/ACTR: Grand fir/vine maple/vanillaleaf, R6 E TP-004-88
CWS5 33	ABGR/CACH: Grand fir/chinkapin, R6 E TP-004-88
CWS5 34	ABGR/HODI-GP: Grand fir/oceanspray, Gifford Pinchot, R6 E TP-006-88
CWS5 35	ABGR/ACCI-BEAQ/TRLA2: Grand fir/vine maple-tall ORgrape/starflower, R6 E TP-006-88
CWS5 36	ABGR/COCO2/ACTR: Grand fir/hazel/vanillaleaf, R6 E TP-006-88
CWS5 37	ABGR/CONU/ACTR: Grand fir/pacific dogwood/vanillaleaf, R6 E TP-006-88
CWS6	White, grand fir/trailing vine (Whipplea, dwarf bramble, poison oak); Resource Inventory
CWS7	White, grand fir/pachistima, serviceberry
CWS7 22	ABGR/PAMY: Grand fir/pachistima, Daub. '68
CWS8	White, grand fir/low huckleberry; Resource Inventory
CWS8 11	ABGR/VASC: Grand fir/grouse huckleberry, R6 AG 3-1
CWS8 21	ABGR/VACA: Grand fir/dwarf huckleberry, R6 E TP-008-88
CWS9 11	PIEN-ABCO/BOTTOMS: Engelmann spruce-fir bottoms, R6 E 104-85
CWS9 12	ABGR/ACGL: Grand fir/Rocky Mountain maple, R6 E 255-86
CWSC	White fir/tall shrub, cool, Resource Inventory
CWSM	White fir/SW Or., shrub, mesic, Resource Inventory
CWX1 04	Malheur(04) 3A: slope less 30%, CWF3 11, CWS2 11, CWS8 11
CWX2 04	Malheur(04) 3B: slope 30-70%, CWF3 11, CWS2 11, CWS8 11
CWX1 20	Winema(20): CWS1 12, CWS1 14
CWX2 20	Winema(20): CWH1 11
CWX3 20	Winema(20): CLS3 11, CMS1, 11, CRS1 11
CWX4 20	Winema(20): CWC1, CWC2, CWC9, CWH1, CWS1
CWY1 04	Malheur(04) 5A: slope less 30%, CWG1 11, CWG1 12, CDS7 11
CWY2 04	Malheur(04) 5B: slope 30-70%, CW G1 11, CWG1 12, CDS7 11
CWY3 04	Malheur(04) 5C: less 30%, serpen.,CWG1 11, CWG1 12, CDS7 11
CWY4 04	Malheur(04) 5D: 30-70%, serpen, CWG1 11, CWG1 12, CDS7 11
CX	Coniferous forest

Desert

DC	Cold desert (freezing winters)
DC10	Greasewood
DC11 21	SAVE/DIST: Greasewood/saltgrass, Daub '70
DC20	Shadscale
DC30	Winterfat
DC31 21	EULA/POSA3: Winterfat/bluegrass, Daub '70
DC40	Hopsage
DC41 21	GRSP/POSA3: Hopsage/bluegrass, Daub '70

DW	Warm desert
DX	Desert

Forbland

FM	Moist (mesic) forblands in forest zone
FM10	Bracken-blackberry
FM20	Beargrass
FM29 11	XETE-FERU: Beargrass-red fescue, R6 E 257-86
FM30	Forb-grass communities
FM30 11	VISA-ERPE-ELGL: Vetch-peregrine fleabane-wildrye, R6 E 257-86
FM80	Coastal forbland
FM88	Coastal lupine
FM90	Buckwheat scabland
FM91 11	ERDO/POSA3: Douglas' buckwheat/Sandberg's bluegrass, R6 E 255-86
FM91 12	ERST2/POSA3: Strict buckwheat/Sandberg's bluegrass, R6 E 255-86
FM91 13	ERUM-RIDGE: Sulfurflower ridgetops, R6 E 255-86
FM91 22	ERSP/POSA3: Eriogonum sphaerocephalum/Poa, Daub '70
FM91 23	ERDO/POSA3: Eriogonum douglasii/Poa, Daub '70
FM91 24	ERCO/POSA3: Eriogonum compositum/Poa, Daub '70
FM91 25	ERTH/POSA3: Eriogonum thymoides-Poa, Daub '70
FM99 11	ERLA-PHHE: Eriophyllum-phacelia, R6 E 257-86
FS	Subalpine forb fields, alpine forb fields
FS10	Subalpine-valerian
FS20	Subalpine-moist: lupine-indian paintbrush-buttercup
FS30	Subalpine-wet: saussurea-monkeyflower-marshmarigold
FS40	Subalpine-luetka
FS50	Subalpine-fleeceflower
FS59 11	POPH-ALPINE: Blue mountain subalpine fleeceflower, R6 AG 3-1
FS60	Subalpine-lupine-aster-grass
FS70	Subalpine-cushion plant
FW	Wet forblands, forb meadows
FW10	Cowparsnip wetlands
FW20	Cottonsedge/sphagnum-sedge wetlands
FW30	Camas wetlands
FW39 11	CACU-SEEP: Cusick's camas seepage, R6 E 255-86
FW40	Groundsel, beadrily wetlands
FW41 11	CLUN(ALIN): queen's cup beadrily scattered alder wetland, R6 E TP-279-87
FW42 11	SETR: Arrowleaf groundsel wetland, R6 E TP-279-87

FW50	False hellebore wetlands
FW51 11	VERAT-HELA: False hellebore-common cowparsnip, R6 E 257-86
FW51 21	VECA: California false hellebore, R6 E TP-279-87
FX41 11	LECOW-RIM: Wallowa lewisia rims, R6 E 255-86
FX	Forbland

Grassland

GA	Annual grass vegetation
GA10	Cheatgrass
GA20	Medusahead
GA30	Dogtail
GA40	Soft chess
GB	Bunchgrass vegetation
GB10	Threeawn-sand dropseed
GB11 21	SPCR/POSA3: Sand dropseed/bluegrass, Daub '70
GB11 22	ARLO3/POSA3: Threeawn/bluegrass, Daub '70
GB12 11	SPCR-TERRACE Sand dropseed river terrace, R6 E 255-86
GB19 11	AGSP-SPCR-ARL03: Wheatgrass-sand dropseed-red threeawn, R6 E 255-86
GB20	Needlegrass
GB21 21	STOC/POSA3: Needlegrass/bluegrass, Daub '70
GB21 22	STOC/POSA3-ERNI: Needlegrass/bluegrass-erigonum, Daub '70
GB30	Squirreltail
GB40	Wheatgrass
GB41	Bluebunch wheatgrass; Resource Inventory
GB41 11	AGSP/ERHE: Bluebunch wheatgrass/Wyeth's buckwheat, R6 E 255-86
GB41 12	AGSP/POSA3/SCAN: Wheatgrass/bluegrass/narrow-leaved skullcap, R6 E 255-86
GB41 13	AGSP/POSA3-BASALT: Wheatgrass/Sandberg's bluegrass-basalt, R6 E 255-86
GB41 14	AGSP/POSA3/ASCU4: Wheatgrass/Sandberg's bluegrass/Cusick's milkvetch, R6 E 255-86
GB41 15	AGSP/POSA3/ERPU: Wheatgrass/Sandberg's bluegrass/shaggy fleabane, R6 E 255-86
GB41 16	AGSP/POSA3-GRANITE: Wheatgrass/Sandberg's bluegrass-granite, R6 E 255-86
GB41 17	AGSP/POSA3/PHCO2: Wheatgrass/Sandberg's bluegrass/Snake R. pholx, R6 E 255-86
GB41 18	AGSP/POSA3/OPPO: Wheatgrass/Sandberg's bluegrass/prickly pear, R6 E 255-86
GB41 21	AGSP/POSA3: Wheatgrass/bluegrass, Daub '70
GB41 22	AGSP-FEID: Wheatgrass/fescue, Daub '70
GB42	Whitmar wheatgrass (seeded or native)
GB43	Crested wheatgrass (seeded)
GB49 11	AGSP/POSA3-SCAB: wheatgrass scabland, R6 AG 3-1, R6 E 255-86
GB49 12	AGSP-FEID-DEEP/GENT: Bunchgrass, deep soil, gentle, R6 AG 3-1
GB49 13	AGSP/POSA3-SHAL/STP: Bunchgrass, shallow soil, steep, R6 AG 3-1

GB49 14	AGSP/FEID-DEEP/STP: Bunchgrass, deep soil, steep, R6 AG 3-1
GB50	Fescue; Resource Inventory
GB51 21	FEID-SYAL-AGSP: Idaho Fescue-snowberry-wheatgrass, Daub '70, R6 E 255-86
GB51 22	FEID-RONU: Idaho Fescue-rose, Daub '70
GB51 23	FEID-HICY: Idaho Fescue-hieraceum, Daub '70
GB59 11	FEID/KOCR-RIDGE: Idaho fescue/prairie junegrass ridges, R6 E 255-86
GB59 12	FEID/KOCR-MOUND: Idaho fescue/prairie junegrass mounds, R6 E 255-86
GB59 13	FEID/KOCR-HIGH: Idaho fescue/prairie junegrass high elev., R6 E 255-86
GB59 14	FEID/KOCR-LOW: Idaho fescue/prairie junegrass low elev., R6 E 255-86
GB59 15	FEID-AGSP-RIDGE: Idaho fescue-bluebunch wheatgrass ridges, R6 E 255-86
GB59 16	FEID-AGSP/LUSE: Idaho fescue-bluebunch wheatgrass/silky lupine, R6 E 255-86
GB59 17	FEID-AGSP/BASA: Idaho fescue-bluebunch wheatgrass/balsamroot, R6 E 255-86
GB59 18	FEID-AGSP/PHCO2: Idaho fescue-wheatgrass/Snake River phlox, R6 E 255-86
GB59 19	FEID-SYAL/KOCR: Idaho fescue-snowberry/prairie junegrass, R6 E 255-86
GB59 20	FEID/DAIN-CAREX: Idaho fescue/timber oatgrass-sedge, R6 E 255-86
GB59 21	FEID-CAHO: Idaho fescue-Hood's sedge, R6 E 255-86
GB59 22	FEID/CAREX: Idaho fescue/sedge, R6 E 255-86
GB60	Rough fescue
GB70	Giant wildrye
GB71 11	ELCI: Basin wildrye, R6 E 255-86
GB71 21	ELCI/DIST: Giant rye/saltgrass, Daub '70
GB90	Bunchgrass scabland; Resource Inventory
GB91 11	POSA-SCAB: Bluegrass scabland, R6 AG 3-1, R6 E 255-86
GB99	Scabland (Poa, Danthonia), R6 E 104-85
GBB0	Bunchgrass, bisbuit-swale
GBB9 11	Biscuit - scabland complex, R6 AG 3-1
GBB9 21	Complex of GB59 12 and GB91 11 Biscuit-scabland, R6 E 255-86
GBC0	Bunchgrass with a few scattered conifers
GBFX	Snake River grass-Forb; Resource Inventory
GBS0	Bunchgrass with a few scattered shrubs
GBX1 04	Malheur(04) 7A: slope less 30%,GB49 11, GB49 12
GBX2 04	Malheur(04) 7B: slope 30-70%, GB49 13, GB49 14
GBX3 04	Malheur(04) 7C: slope less 30%, serpentine, GB49 11, GB49 12
GBX4 04	Malheur(04) 7D: slope 30-70%, serpentine, GB49 13, GB49 14
GM	Moist (mesic) grassland within forest zone
GM10	Needlegrass interior valley, Willamette, Puget Sound
GM20	Red fescue interior valley, Willamette, Puget Sound
GM30	Oatgrass-needlegrass interior valley
GM40	Floodplain grasslands
GM41 11	CACA: bluejoint reegrass, R6 E TP-279-87
GM41 12	ELGL: Blue wildrye, R6 E TP-279-87

GM41 21	ELGL-BROMUS: Blue wildrye-bromegrass, R6 E 257-86
GM80	Coastal grassland
GMB9	Puget mina mounds
GMC9	Moist (mesic) grassland with some scattered conifers
GMFX	Mesic grass-Forb, Resource Inventory
GMS9	Moist, mesic grassland with some scattered shrubs
GR	Rhizomatous grass or sedge vegetation
GR10	Low sedge
GR20	Blue gramma
GR30	Saltgrass
GR31 21	DIST: Saltgrass, Daub '70
GR80	Beachgrass
GR81	Foredune (sandy dune geology) beachgrass
GR81 11	Foredune & beachgrass, Sius
GR82	Hummocks (sand dune geology) beachgrass
GR82 11	Hummocks, occ. wet: dense beachgrass/lupine/bluegrass, Sius
GR82 12	Hummocks, occ. wet, unstable: open beachgrass/lupine, Sius
GR82 13	Hummocks, dry, eroding; beachgrass/lupine/bluegrass, Sius
GR83	Dune slip face: beachgrass
GR83 11	Dune slip face: beachgrass, stabilized, Sius
GS	Subalpine or alpine grassland
GS10	Alpine bunchgrass
GS11	Green fescue; Resource Inventory
GS11 11	FEVI-CAHO: Green fescue-Hood's sedge, R6 E 255-86
GS11 12	FEVI/LULA2 Green fesue/spurred lupine, R6 E 255-86
GS12	Alpine Idaho fescue
GS12 11	FEID-ALPINE: Subalpine Idaho fescue, R6 AG 3-1
GS13	Alpine-rough fescue
GS20	Alpine-tall sedge
GS30	Alpine-short, dense sedge
GS39 11	CAGE-ALPINE: Subalpine elk sedge, R6 AG 3-1
GS40	Alpine-short, thin sedge
GS50	Alpine needlegrass, squirreltail grass
GSC0	Grasslands, subalpine to alpine with scattered conifers
GSXX	Alpine xeric grasslands; Resource Inventory
GSY1 04	Malheur(04) 9C:slope -30%,serpent,SD91 11,CJS8 11,GS91 11
GSY2 04	Malheur(04) 9D:30-70%,serpentine,SD91 11,CJS8 11,GS91 11
GX	Grassland

Hardwood Forest

HA	Alder, red
HAC0	Alder with important associated conifers
HAF0	Alder with forb dominated ground vegetation
HAF1	Alder/swordfern
HAH0	Alder with important associated hardwoods
HAM0	Alder wetlands (moist to wet soil)
HAM1	Red alder-overflow bottomland
HAM2	White alder -overflow bottomland
HAS0	Alder with shrub dominated ground vegetation
HAS1	Alder/salmonberry, thimbleberry
HAZ2 12	Siuslaw(12): pure alder (TM type map, temporary)
HAZ3 12	Siuslaw(12): alder-conifer, alder predominant(TM type map,temp)
HB	Bigleaf maple
HBM0	Bigleaf maple wetlands (moist to wet soil)
HBM1	Bigleaf maple-overflow bottomlands, moist
HBS0	Bigleaf maple with shrub dominated ground vegetation
HBS1	Bigleaf maple/vine maple talus slopes
HBS2	Bigleaf maple/hazel/swordfern
HC	Cottonwood, ash, bottom land, overflow bottom
HCC0	Cottonwood, ash bottomland with some scattered conifers
HCC1 11	POTR2-PIEN/ALIN-COST: Cottonwood-spruce/alder-dogwood, R6 E TP-279-87
HCG0	Black cottonwood/grass,sedge
HCG1 11	POTR2/CAEU: Black cottonwood/widefruit sedge wetlands, R6 E TP-279-87
HCS0	Cottonwood-willow with shrub dominated ground vegetation
HCS1	Cottonwood-willow
HCS1 11	POTR2/ALIN/CALA3: Black cottonwood/alder/wooly sedge, R6 E TP-279-87
HCS1 21	POTR2/CIDO: Cottonwood/cicuta wetlands, Daub '70
HCS2	Ash-willow
HCS3	Black cottonwood/snowberry, spiraea
HCS3 11	POTR2/SYAL/POPR Black cottonwood/snowberry/bluegrass wetlands, R6 E TP-279-87
HCXX	Black Cottonwood; Resource Inventory
HL	Liveoak, canyon (over 16 ft tall)
HM	Madrone
HMS0	Madrone with shrub dominated ground vegetation

HMS1	Madrone/canyon liveoak
HO	Oak, Oregon white, California black
HOF0	Oak with forb dominated ground vegetation; Resource Inventory
HOF1	Oak/low forb (strawberry, yarrow)
HOG0	Oak with grass dominated ground vegetation
HOG1	Oak/bunchgrass
HOG2	Oak/rhizomatous grass
HOG3	Oak/annual grass
HOS0	Oak with shrub dominated ground vegetation; Resource Inventory
HOS1	Oak/poison oak
HOS2	Oak/cherry, snowberry
HOS3	Oak/serviceberry, snowberry
HOS4	Oak/hazel
HOS5	Oak/deerbrush
HOS6	Oak/bitterbrush
HQ	Quaking aspen
HQC0	Quaking aspen with occassional conifers
HQC1 11	POTR-PICO/SPDO/FORB: Aspen-lodgepole/spiraea-forb, R6 E TP-279-87
HQC1 12	POTR-PICO/ARUV: Quaking aspen-lodgepole/bearberry, R6 E TP-279-87
HQG0	Aspen/grass, dryland
HQG1	Quaking aspen /pinegrass; Resource Inventory
HQG1 11	POTR/CARU: quaking aspen/pinegrass, R6 E 132-1983
HQM0	Quaking aspen wetlands (moist to wet soils); Resource Inventory
HQM1	Aspen/grass wetland
HQM1 21	POTR/ELGL: Quaking aspen/blue wildrye, R6 E TP-279-87
HQM2	Aspen/tall sedge (Carex nebraskensis) wetland
HQM2 11	POTR/CALA3: Quaking aspen/wooly sedge, R6 E TP-279-87
HQM3	Aspen/short sedge wetland
HQM4	Aspen/shrub wetland
HQM4 11	POTR-PICO/SPDO/CAEU: Aspen-lodgepole/Douglas'sprirea/widefruit, R6 E TP-279-87
HQS0	Quaking aspen with shrub dominated ground vegetation
HQS1	Aspen/hawthorn
HQS2	Aspen/snowberry; Resource Inventory
HQS2 11	POTR/SYAL: quaking aspen/snowberry, R6 E 132-83
HQS2 21	POTR/SYAL/ELGL: Quaking aspen/snowberry,blue wildrye, R6 E TP-279-87
HT	Tanoak (over 16 feet tall)
HTC0	Tanoak with important conifers; Resource Inventory
HTC1	Tanoak-redwood
HTC2	Tanoak-western hemlock
HTC3	Tanoak-Port orford cedar
HTC4	Tanoak-white fir

HTH0	Tanoak with important associated hardwoods
HTH1	Tanoak-canyon liveoak; Resource Inventory
HTH2	Tanoak-California laurel
HTH3	Tanoak-vine maple
HTS0	Tanoak with shrub dominated ground vegetation
HTS1	Tanoak/evergreen huckleberry; Resource Inventory
HTS2	Tanoak/rhododendron; Resource Inventory
HTS3	Tanoak/Oregon grape, salal; Resource Inventory
HTS4	Tanoak/poison oak
HTS5	Tanoak/California coffyberry; Resource Inventory
HX	Hardwood forest

Meadow, Grass-sedge

MD	Dry meadow (water table available part of the growing season)
MD10	Cusick bluegrass dry meadow
MD19 11	POCU-DRY MEAD: Cusick bluegrass dry meadow, R6 E 104-85, R6 E TP-279-87
MD20	Tufted hairgrass
MD30	Kentucky bluegrass dry meadows
MD31 11	POPR-DRY MEAD: Kentucky bluegrass dry meadow, R6 E 79-004, R6 E TP-279-87
MD31 12	POPR-RIDGE: Kentucky bluegrass meadows on ridges, R6 E 255-86
MDC0	Dry meadow with some scattered conifers
MDMW	Grass-sedge dry, moist and wet meadows; Resource Inventory
MM	Moist meadow (water table available all growing season)
MM10	Tufted hairgrass moist meadow
MM19	Tufted hairgrass moist meadow, R6 E 104-85
MM19 11	DECA-CANE: Tufted hairgrass -Nebraska sedge, R6 E 79-004
MM19 12	DECA: Tufted hairgrass moist meadow, R6 E TP-279-87
MM19 21	DECA-MOIST CAREX: Tufted hairgrass moist meadow sedges, R6 E 255-86
MM19 22	DECA-WET CAREX: Tufted hairgrass wet meadow sedges, R6 E 255-86
MM20	Moist meadow-tall sedge
MM29 11	CALA3: Wooly sege moist meadow, R6 E TP-279-87
MM29 12	CANE: Nebraska sedge moist meadow, R6 E TP-279-87
MM29 13	CAEU: Widefruit sege moist meadow, R6 E TP-279-87
MM29 14	CAAQ: Aquatic sedge moist meadow, R6 E TP-279-87
MM29 15	CASI2: Shortbeak sedge moist meadow, R6 E TP-279-87
MM30	Moist meadow-short sedge
MM39 11	CAREX-CABI: Sedge-marshmarigold, R6 E 257-86
MM40	Moist meadow-redtop

MM50	Moist meadow-spikesedge
MM80	Moist meadow-coastal/grasses, forbs
MM90	Moist kentucky bluegrass meadow, R6 E 104-85
MMB0	Meadow complex/ wet-moist-dry pothole
MMB8	Deflation plain potholes/slough sedge-brown rush-red fescue Sius
MMC0	Moist meadow with some scattered conifers
MSXX	Subalpine to alpine grass-sedge meadows; Resource Inventory
MMX1 04	Malheur(04) 10A: slope less 15%, MD, MM, MW (meadows)
MS	Subalpine/alpine moist to wet meadows
MS10	Subalpine dry grass,sedge,forb meadows
MS11 11	CAPR: Brewer sedge dry subalpine meadow, R6 E TP-279-87
MS20	Subalpine moist grass,sedge,forb meadows
MS21 11	CANI2: Black sedge moist subalpine meadow, R6 E TP-279-87
MS21 12	CASC5-CANI2-DECA: Holms-black sedge-hairgrass subalpine meadow, R6 E TP-279-87
MS30	Subalpine wet grass,sedge, forb meadows
MS31 11	CASC5: Holm's sedge subalpine wet meadow, R6 E TP-279-87
MSC0	Sub-alpine to alpine meadows with some scattered conifers
MT	Tule meadow (standing water most or all of growing season)
MT10	Bullrush
MT19 11	CAREX-SCIRPUS (HYDRIC): Sedge-bulrush (hydric), R6 E 257-86
MT80	Cattail, bullrush
MT81 11	Cattail-bullrush/water lilly, water-weed, Siuslaw
MT99	Coastal saline water
MW	Wet meadow (surface moist or wet all growing season), R6 E 104-85
MW10	Wet meadow-tall sedge, R6 E 255-86
MW19 11	CANE-JUBA: Nebraska sedge, R6 E 79-004
MW19 21	SCMI(CAAM): Samllfruit bulrush-bigleaf sedge, R6 E TP-279-87
MW19 22	CASI3: Sitka sedge, R6 E TP-279-87
MW19 23	CAVE: Inflated sedge, R6 E TP-279-87
MW19 24	CARO2: Beaked sedge, R6 E TP-279-87
MW19 25	CAIN3: Green-fruited sedge, R6 E TP-279-87
MW20	Wet meadow-short sedge
MW29 11	CALA4: Slender bog sedge, R6 E TP-279-87
MW30	Wet meadow-rush
MW39 11	JUNE: Nevada rush, R6 E TP-279-87
MW39 12	JUBA: Baltic rush, R6 E TP-279-87

MW40	Wet meadow-spikesedge
MW49 11	ELPA2: Few-flowered spikerush, R6 E TP-279-87
MW49 12	ELPA: Creeping spikerush, R6 E TP-279-87
MW80	Wet meadow-coastal, fresh water
MW81 11	Valley fill: slough sedge/skunk cabbage, red current, Sius
MW81 12	Slough sedge/water lily-pondweed, cattail, Sius
MW90	Wet meadow-coastal, salt spray influence
MWC0	Wet meadow, surface moisture, with some scattered conifers
MX	Meadow, grass-sedge

Non-Vegetated Land (less than 10% potential vegetative cover)

NA	Avalanche paths, sparsely to non-vegetated
NAC0	Avalanche paths with a few scattered conifers
NAS0	Avalanche paths with a few scattered shrubs or brush
NC	Cinders, lava flow, mud flow, glacial wash(less than 10% veg)
NCA0	Alpine-subalpine cinders, lava flow, mud flow, glacial wash
NCA1	Alpine-trees (whitebark pine, Subalpine fir, mtn. hemlock)
NCA1 11	PIAL-CINDERS: Steep cinders,whitebark pine-mt.heml/Hulsea, Will
NCA2	Alpine grass-sedge (cinders, lava, pumice)
NCA3	Alpine juniper (Juniperous communis)/ cinders, lava, pumice
NCA4	Hulsea, cushion plants on cinders, lava flow, glacial wash
NCA4 11	HULSEA-CINDERS: Alpine,steep cinders-Hulsea, Willa
NCC0	Cinders, lavas, outwash with scattered conifers
NCC1	Mountain hemlock subalpine fir-whitebark pine-lodgepole/cinders, lava, pumice
NCC1 11	PIAL/PENST-LAVA: Alpine, pumice-lava-whitebark pine/penstemem,Willa
NCC2	Western hemlock, cinders, lava, pumice
NCC3	Douglas-fir - true fir, cinders, lava
NCC4	Douglas-fir-oak, cinders, lava
NCC5	Cinders, lava with lodgepole pine
NCC6	Cinders, lava with ponderosa pine
NCH0	Cinders, lavas, outwash with scattered hardwoods
NCH1	Mud-glacial flows with alder, aspen
NCS0	Cinders, lavas, outwash with scattered shrubs
NCS1	Cinders, lavas, outwash with vine maple
NCS1 11	SHRUB (LAVA): Lava flows, scattered vine maple, R6 E 257-86
NCS2	Cinders, lavas, outwash with sitka alder-willow
NF	Flood plain periodically denuded of vegetation
NFC0	Non-vegetated flood plain with scattered conifers

NFS0	Non-vegetated flood plain with scattered willows or shrubs
NI	Ice fields, glaciers, ice caves, ice dominated land
NIT1	Ice tunnel or cave, twilight zone
NIT2	Ice tunnel or cave, zero light zone
NL	Landform failure (natural slumps, avalanches)
NM	Mine tailings, dredgings, man-caused minimal veget. potential
NMC0	Mine tailings, dredgings with scattered conifers
NMC1	Mine tailings, dredgings, lodgepole pine
NMH0	Mine tailings, dredgings with scattered hardwoods
NMH1	Mine tailings, dredgings, cottonwood
NMH2	Mine tailings, dredgings, aspen
NMS0	Mine tailings, dredgings with scattered shrubs
NMS1	Mine tailings, dredgings with willow
NR	Rocky land with minimal vegetation potential
NRA0	Rocky land in alpine or subalpine locations
NRA1	Rocky land with alpine trees
NRA2	Rocky land with alpine grass-sedge
NRA3	Rocky land with alpine juniper
NRA3 11	JUCO-ALP, SCORIA: Subalpine, steep scoria/dwarf juniper, Willa
NRA4	Rocky land with alpine forbs
NRC0	Rock with scattered conifers
NRL0	Ledge or cliff, steeper than 200% (60 degrees)
NRL1	Ledge or cliff, smooth face, verticle distance less 20 ft
NRL2	Ledge or cliff, smooth face, verticle distance more 20 ft
NRL5	Ledge or cliff, broken face/ledges, verticle distance less 20
NRL6	Ledge or cliff, broken face/ledges, verticle distance more 20
NRL9 11	ROCK GARDEN(STEEP,ZERIC): Steep, xeric rock garden, R6 E 257-86
NRL9 12	ROCK GARDEN(STEEP,MOIST): Steep, mosit rock garden, R6 E 257-86
NRQ0	Quarrey, rock pit
NRRO	Flat Rock with scattered plants (less 200% slope)
NR9 11	ROCK GARDEN(FLAT,XERIC): Scattered plants on rock, R6 E 257-86
NRS0	Rocky land with scattered shrubs or brush
NRT1	Tunnel or cave, twilight zone
NRT2	Tunnel or cave, zero light zone
NS	Sand with minimal vegetation, shoreline or interior
NSG0	Sand dunes with scattered grass

NSG1	Sand dune-wildrye-wheatgrass
NSG8	Coastal sand dune, rolling, partial beachgrass stability
NSN0	Open sand of any dunal character, no vegetation
NSN1 11	Pacific coast beach, Sius
NSN2	Transverse ridge, sand dune system, no vegetation
NSN2 11	Transverse ridge, occ. wet, winter stable, Sius
NSN2 12	Transverse ridge, dry, moving sand, Sius
NSN3	Oblique ridge, sand dune system, no vegetation
NSN3 11	Oblique ridge, fore slope, moving sand Sius
NSN3 12	Oblique ridge, precipitation ridge, active sand, Sius
NSN3 13	Oblique ridge, precipitation ridge,active,threat,veget,Sius
NSN4	Parabola ridge, sand dune system, no vegetation
NT	Talus land with minimal vegetation potential
NTA0	Talus slopes in alpine or sub-alpine locations
NTA1	Talus land with alpine trees: pine, mtn. hemlock, Subalpine fir
NTA2	Talus land with alpine grass, sedge
NTA3	Talus land with alpine juniper
NTA4	Talus land with alpine forb
NTC0	Talus land with scattered conifers
NTH0	Talus slopes with scattered hardwoods
NTH1	Talus land with bigleaf maple
NTH2	Talus land with white oak
NTS0	Talus slopes with scattered shrubs
NTS1	Talus land with cherry-snowberry, mockorange
NTS1 11	PHLE2-TALLUS: Syringa bordered tallus strips, R6 E 255-86
NTS2	Talus-vine maple
NTS2 11	ACCI(TALUS): Vine maple common on talus slopes, R6 E 257-86
NTS3	Talus-klamath plum
NTS9 11	TALUS: Talus slopes with little vegetation, R6 E 257-86
NX	Non-vegetated land-less 10% vegetation cover; Resource Inventory

Shrubland

SC	Chaparral, evergreen shrubland, forest zone and non-forest
SC10	Snowbrush (Ceanothus) chaparral
SC20	Manzanita chaparral
SC30	Oak chaparral
SC40	Mahogany chaparral
SC50	Yerbasanta-silktassel chaparral
SC60	Short shrub
SD	Dry shrubland, sagebrush, nonforest zone shrubland not desert

SD10	Low sage
SD19 11	ARAR/AGSP-FEID: Low sage/bunchgrass, R6 AG 3-1
SD19 12	ARAR/FEID/POSA3: Low sagebrush/Idaho fescue, R6 E 104-85
SD19 13	ARAR/FEID/SIHY: Low sage/Idaho fescue-squirreltail, R6 E 79-004
SD20	Big sage
SD21	Big sagebrush
SD21 21	ARTR/AGSP: Big sage/wheatgrass, Daub '70
SD21 22	ARTR/FEID: Big sage/fescue, Daub '70
SD21 23	ARTR/STCO: Big sage/needlegrass, Daub '70
SD21 24	ARTR/POSA3: Big sage/bluegrass, Daub '70
SD22	Threetip sagebrush
SD22 21	ARTR2/FEID: Threetip sage/fescue, Daub '70
SD22 22	ARTR2/STCO: Threetip sage/needlegrass, Daub '70
SD22 23	ARTR2/AGSP: Threetip sage/wheatgrass, Daub '70
SD23	Silver sagebrush
SD23 11	ARTR-ARCA/POCU: big sage-silver sage/Cusick bluegrass, R6 E TP-279-87
SD29 11	ARTR/AGSP-FEID: Big sage/wheatgrass-fescue, R6 AG 3-1, R6 E 255-87
SD29 12	ARTR/FEID-AGSP: Big sagebrush/bunchgrass, R6 E 104-85
SD29 13	ARTR-PUTR/FEID-AGSP: Big sage-bitterbrush/bunchgrass, R6 E 104-85
SD29 14	ARTR/STOC-RHYO: Sagebrush/needlegrass, rhyolite pumice, R6 E 104-85
SD29 15	ARTRV/CAGE: Mountain big sagebrush/elk sedge, R6 E 255-86
SD29 16	ARTRV-PUTR/FEID: Mnt. big sage-bitterbrush/Idaho fescue, R6 E 255-86
SD29 17	ARTRV-SYOR: Mnt. big sagebrush-mountain snowberry, R6 E 255-86
SD30	PERA3-SYOR: Squaw apple-mountain snowberry, R6 E 255-86
SD31	Bitterbrush, R6 AG 3-1
SD31 11	PUTR/FEID: Bitterbrush/Idaho fescue, R6 E 255-86
SD31 12	PUTR/AGSP: Bitterbrush/bluebunch wheatgrass, R6 E 255-86
SD31 21	PUTR/STCO: Bitterbrush/needlegrass, Daub '70
SD31 22	PUTR/AGSP-DAUB: Bitterbrush/wheatgrass, Daub '70
SD31 23	PUTR/FEID-DAUB: Bitterbrush/fescue, Daub '70
SD33 11	PUTR/STOC-PUM: Bitterbrush/needlegrass, pumice, R6 E 104-85
SD40	Mountain mahogany, R6 AG 3-1, R6 E 255-86
SD50	Hackberry-hawthorn
SD51 21	CRDO/SYAL: Hawthorn/common snowberry, Daub '70
SD56 11	CERE2/AGSP: Netleaf hackberry/bluebunch wheatgrass, R6 E 255-86
SD56 21	CERE2/BRTE: Netleaf hackberry/cheatgrass, Daub '70
SD60	Smooth sumac
SD61 21	RHGL/AGSP: Smooth sumac/wheatgrass, Daub '70, R6 E 255-86
SD61 22	RHGL/SPCR: Smooth sumac/sand dropseed, Daub '70
SD61 23	RHGL/ARLO: Smooth sumac/threawn, Daub '70
SD65	GLNE/AGSP: Spiny green-bush/bluebunch wheatgrass, R6 E 255-86
SD70	Rabbitbrush
SD80	Snowberry-cherry-rosa

SD90	Scabland dominated by shrubs; Resource Inventory
SD91	Rigid sage
SD91 11	ARRI/POSA3-SCAB: Rigid sage/bluegrass scabland, R6 AG 3-1, R6 E 255-86
SD91 21	ARRI/POSA3-DAUB: Rigid sage/bluegrass, Daub '70
SD91 31	ARRI/POSA3-LOMA: Rigid sage/bluegrass-lomatium, scabland, R6 E 133-83
SD92	Low sage scabland
SD92 11	ARAR/POSA3-HAST: Low sage/bluegrass-haplopappus, R6 E 79-004
SD92 12	ARAR/POSA3-DAUN: Low sage/bluegrass-oatgrass, R6 E 79-004
SD93	Shrubby Eriogonum scablands
SD93 21	ERNI/POSA3: Eriogonum niveum/Poa secunda, Daub '70
SD93 22	ERMI/PHOR: Eriogonum microthecum/Physaria, Daub '70, R6 E 255-86
SD93 23	ERUM/STIPA-PUM: Buckwheat flats, rhyolite pumice, R6 E 104-85
SDB9	Biscuit-scabland complex, sagebrush, R6 AG 3-1
SDC0	Dry shrubland, sagebrush, with scattered conifers
SDXX	Xeric shrubs, Resource Inventory
SDX1 04	Malheur(04) 8A:less 30%/SD19 11, SD29 11, SD39, SD49, CPS1 11, CJS1 11, CJS2 11
SDX2 04	Malheur(04) 8B:30-70%/SD19 11, SD29 11, SD39, SD49, CPS1 11, CJS1 11, CJS2 11
SDY1 04	Malheur(04) 9A:less 30% slope/SD91 11, CJS8 11, GB91 11. SCAB
SDY2 04	Malheur(04) 9B:slope 30-70%/SD91 11, CJ38 11, GB91 11. SCAB
SM	Moist (mesic) shrubland, forest zone shrubs and shrubland
SM10	Ninebark, R6 AG 3-1, R6 E 255-86
SM20	Alder snow slides, R6 AG 3-1
SM30	Cherry-mockorange-serviceberry-rose-oceanspray
SM31	Snowberry shrubland, R6 AG 3-1
SM31 11	SYAL-ROSA: Common snowberry-rose, R6 E 255-86
SM32	SYOR: Mountain snowberry shrubfields, R6 E 255-86
SM39 11	SHRUB BOTTOMS: Mixed shrub bottoms, R6 E TP-279-87
SM40	Big huckleberry
SM50	Salmonberry-blackberry
SM59 11	RUPA/POPH: Huckleberry-pokeweed fleecflower, R6 E 257-86
SM80	Coastal, west-side shrubs
SM81	Tall shrub
SM81 11	ALSI(ROCKY SOIL): Sitka alder on rocky soil, R6 E 257-86
SM81 12	ACCI(ROCKY SOIL): Vine maple on rocky soil, R6 E 257-86
SM82	Mid shrub
SM83	Short shrub
SM84	Gorse
SM90	Scabland dominated by mesic shrubs

SMB0	Biscuit-scabland complex, moist shrub-eriogonum
SMC0	Moist(mesic) shrubland in forest zone with scattered conifers
SMXX	Mesic shrub, Resource Inventory
SS	Subalpine and alpine shrubland
SS10	Alpine heath-heather
SS19 11	PHEM: Red mountain heath meadow, R6 E TP-279-87
SS20	Alpine mountain juniper
SS30	Alpine deciduous shrub
SS40	Alpine sage
SS49 11	ARTRS/CAGE: Alpine sage/elk sedge, R6 AG 3-1
SS49 21	ARAR/FERU: Alpine low sage/red fescue, R6 E 79-004
SS50	Alpine low blueberry
SSC0	Subalpine shrubland with some scattered conifers
SSXX	Subalpine shrubs, Resource Inventory
SX1 04	Malheur(04) 1A:SS49 11,GS39 11, GS12 11, CAG1 11, FS59 11
SW	Shrub wetlands, shrubs less 16 ft. tall
SW10	Willow wetlands
SW11 11	SALIX/POPR: Willow/Kentucky bluegrass, R6 E TP-279-87
SW11 12	SALIX/CALA3: Willow/woolly sedge, R6 E TP-279-87
SW11 13	SALIX/CAEU: Willow/widefruit sedge, R6 E TP-279-87
SW11 14	SALIX/CAAQ: Willow/aquatic sedge, R6 E TP-279-87
SW11 15	SALIX/CASI3: Willow/sitka sedge, R6 E TP-279-87
SW11 16	SALIX/CARO2: Willow/beaked sedge, R6 E TP-279-87
SW11 17	SAEX: Coyote willow, R6 E TP-279-87
SW11 18	SALIX/ACCO: willow/monkshood, R6 E TP-279-87
SW11 19	SALIX/DECA: Willow/tufted hairgrass, R6 E TP-279-87
SW11 20	SAEA-SACO2-BOG: Eastwood-undergreen willow bog, R6 E TP-279-87
SW11 21	SAEA-SAC02/CASC: Eastwood-undergreen willow/sedge, R6 E TP-279-87
SW11 22	SAEA-SABO/CANI2: Eastwood-Booth willow/black sedge, R6 E TP-279-87
SW20	Alder wetlands
SW21 21	ALRH: White alder, Daub '70
SW22 11	ALIN/SYAL: Mountain alder/common snowberry, R6 E TP-279-87
SW22 12	ALIN/SPDO: Mountain alder/Douglas spiraea, R6 E TP-279-87
SW22 13	ALIN-SPRING: Mountain alder spring, R6 E TP-279-87
SW22 14	ALIN-BANK: Mountain alder bank association, R6 E TP-279-87
SW29 11	ALIN: Mountain alder shrubfield, R6 E TP-279-87
SW30	Hawthorn wetlands

SW31 11	CRDO: Douglas hawthorn, R6 E TP-279-87
SW31 20	CRDO/SYAL: Hawthorn/snowberry, Daub '70
SW31 21	POTR/CRDO/SYAL: Aspen/Hawthorn/snowberry, Daub '70
SW31 22	CRDO/HELA: Hawthorn/heracleum, Daub '70
SW31 23	POTR/CRDO/HELA: Aspen/Hawthorn/heracleum, Daub '70
SW40	Spiraea, blueberry wetlands
SW41 11	VAOC2/CASI3: Bog blueberry/sitka sedge, R6 E TP-279-87
SW41 12	VAOC2/ALPA2: Bog blueberry/few-flowered spikerush, R6 E TP-279-87
SW41 13	SPDO: Douglas'spiraea, R6 E TP-279-87
SW41 21	VACCI-SPDE/GRASS: Huckleberry-spiraea-grass wetland, R6 E 257-86
SW41 22	SPDO-VAUL/CAREX(HYDRIC): spiraea-huckleberry-sedge wetland, R6 E 257-86
SW41 23	SPIRAEA-SALIX/CAREX: spiraea-sedge wetland, R6 E 257-86
SW80	Coastal shrub wetlands (Salix, Myrica)
SW81	Coastal shrubs in a deflation plain
SW81 11	Deflat; plain, high water:willow-wax myrtle,salal,pine, Sius
SW81 12	Deflat; plain, high water:salal-evergn huckleb,willow, Sius
SWC0	Wet shrubland, shrub meadows with some scattered conifers
SWXX	Wet shrubland; Resource Inventory
SX	Shrubland
TX	Tundra

Water Covered Areas

WE	Estuary systems - interface between fresh and saline water
WE10	Bar built geology - sand dune estuarian system
WE11	Bar built fresh-saline water highly stratified
WE12	Bar built fresh-saline water moderately mixed
WE13	Bar built fresh-saline water well mixed
WE13 11	Bar built, well mixed saline/ active flood plain, Sius
WE13 19	Bar built, well mixed saline, tidal exposed sandy bottom
WE13 29	Bar built, well mix saline, tidal exposed clay bottom
WE13 39	Bar built, well mix saline, tidal exposed stony bottom
WE13 59	Bar built, well mix saline, tidal salt marsh (eelgrass)
WE20	Drowned river estuarian system
WE21	Drowned river/ fresh-saline water highly stratified
WE22	Drowned river/ fresh-saline water moderately mixed
WE23	Drowned river/ fresh-saline water well mixed
WE31	Fjord/ fresh-saline water highly stratified
WE32	Fjord/ fresh-saline water moderately mixed
WE33	Fjord/ fresh-saline water well mixed
WE30	Fjord type of estuarian system
WE40	Tectonic (faulted) estuarian system

WE41	Tectonic/fresh-saline water highly stratified
WE42	Tectonic/ fresh-saline water moderately mixed
WE43	Tectonic/ fresh-saline water well mixed
WO	Oceans, seas, saline water bodies
WO10	Deep water, abyss
WO20	Ocean intertidal beach
WO30	Oceanic continental shelf
WR	Running water - stream, river, creek, ditch
WR10	Perennial, max mo. mean temperature less 45F(7C)
WR11	Perennial, max mo. mean temp less 45F, less 1% grade
WR12	Perennial, max mo. mean temp less 45F, 1-3% grade
WR13	Perennial, max mo. mean temp less 45F, 3-6% grade
WR14	Perennial, max mo. mean temp less 45F, 6-12% grade
WR15	Perennial, max mo. mean temp less 45F, more 12% grade
WR20	Perennial, max mo. mean temperature 45F-55F(7C-13C)
WR21	Perennial, max mo. temp 45F-55F, less 1% grade
WR22	Perennial, max mo. temp 45F-55F, 1-3% grade
WR23	Perennial, max mo. temp 45F-55F, 3-6% grade
WR24	Perennial, max mo. temp 45F-55F, 6-12% grade
WR25	Perennial, max mo. temp 45F-55F, greater 12% grade
WR30	Perennial, max mo. mean temperature 55F-65F (13C-18C)
WR31	Perennial, max mo. temp 55F-65F, less 1% grade
WR32	Perennial, max mo. temp 55F-65F, 1-3% grade
WR33	Perennial, max mo. temp 55F-65F, 3-6% grade
WR34	Perennial, max mo. temp 55F-65F, 6-12% grade
WR35	Perennial, max mo. temp 55F-65F, greater 12% grade
WR40	Perennial, max mo. mean temperature 65F-75F (18C-24C)
WR41	Perennial, max mo. temp 65F-75F, less 1% grade
WR42	Perennial, max mo. temp 65F-75F, 1-3% grade
WR43	Perennial, max mo. temp 65F-75F, 3-6% grade
WR44	Perennial, max mo. temp 65F-75F, 6-12% grade
WR45	Perennial, max mo. temp 65F-75F, greater 12% grade
WR50	Perennial, max mo. mean temperature greater 75F (24C)
WR51	Perennial, max mo. temp greater 75F, less 1% grade
WR52	Perennial, max mo. temp greater 75F. 1-3% grade
WR53	Perennial, max mo. temp greater 75F. 3-6% grade
WR54	Perennial, max mo. temp greater 75F. 6-12% grade
WR55	Perennial, max mo. temp greater 75F. greater 12% grade
WR90	Intermittent streams, rivers
WX	Water covered areas (no association specified); Resource Inventory

WL	Lake, pond, impoundment, non-moving water
WL10	Perennial water, no ice cover during average year
WL11	Perennial, no ice cover, less 5 acres
WL12	Perennial, no ice cover, 5-25 acres
WL13	Perennial, no ice cover, 25-100 acres
WL14	Perennial, no ice cover, 100-500 acres
WL15	Perennial, no ice cover, over 500 acres
WL20	Perennial, ice cover less than 30 days, average year
WL21	Perennial, ice less 30 days, less 5 acres
WL22	Perennial, ice less 30 days, 5-25 acres
WL23	Perennial, ice less 30 days, 25-100 acres
WL24	Perennial, ice less 30 days, 100-500 acres
WL25	Perennial, ice less 30 days, over 500 acres
WL30	Perennial, ice cover 30-90 days during average year
WL31	Perennial, ice 30-90 days, less 5 acres
WL32	Perennial, ice 30-90 days, 5-25 acres
WL33	Perennial, ice 30-90 days, 25-100 acres
WL34	Perennial, ice 30-90 days, 100-500 acres
WL35	Perennial, ice 30-90 days, over 500 acres
WL40	Perennial, ice cover 90-150 days, during average year
WL41	Perennial, ice 90-150 days, less 5 acres
WL42	Perennial, ice 90-150 days, 5-25 acres
WL43	Perennial, ice 90-150 days, 25-100 acres
WL44	Perennial, ice 90-150 days, 100-500 acres
WL45	Perennial, ice 90-150 days over 500 acres
WL50	Perennial, ice cover 150-210 days during average year
WL51	Perennial, ice 150-210 days, less 5 acres
WL52	Perennial, ice 150-210 days, 5-25 acres
WL53	Perennial, ice 150-210 days, 25-100 acres
WL54	Perennial, ice 150-210 days, 100-500 acres
WL55	Perennial, ice 150-210 days, over 500 acres
WL60	Perennial, ice cover longer than 210 days, average year
WL61	Perennial, ice long 210 days, less 5 acres
WL62	Perennial, ice longer 210 days, 5-25 acres
WL63	Perennial, ice longer 210 days, 25-100 acres
WL64	Perennial, ice longer 210 days, 100-500 acres
WL65	Perennial, ice longer 210 days, over 500 acres
WL90	Intermittent lake, pond, impoundment

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